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MET O 3 TECHNICAL NOTE NO. 26

A STUDY OF THE CLIMATOLOGICAL SERVICES ENQUIRY BUREAU

by

D G H Battye

(This report has not been published. Permission to quote from it should be obtained from the Assistant Director of the Climatological Services Branch of the Meteorological Office).

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INTRODUCTION

This report is of a 6 month study of the Enquiry Bureau of the Meteorological Office Climatological Services branch, more conveniently referred to as Met O 3b. The report was commissioned with the concept of an 'outsider' to enquiry work suggesting ways in which 3b could increase its revenue, and if necessary, ways in which work methods needed to be changed to bring this about.

It has been found in fact that most of the study became concerned with the methods of reply to customers and the records kept. This in itself is the main conclusion of the study; that so much work had to be put into consideration of enquiry service reconstruction indicates that much work is needed to create a service ready for expansion. At present, there is little formal knowledge of what is happening in the enquiry field.

The second strand of change that runs through the report is a question of attitude. Overall, the enquiry service needs to be run along more business-like lines. Individually, there is a lack of sense of direction and also sense of importance of the work. These individual and overall objectives are compatible, not opposed.

KW

ENQUIRY LOGGING

Introduction

The 3b system of paperwork associated with enquiries has been studied and the results are presented here. Comparisons are made with the methods used by other branches in dealing with enquiries Some proposals for a new system are made arising from these studies.

Part 1. The aims of an office procedure

The aim of any office procedure is to ensure that correspondence is dealt with efficiently, that important information has been recorded and once completed the correspondence is stored in a known position to allow easy retrieval. The efficiency of an information system can be assessed by three factors (Tavernier, 1972):

i) Relevance. Information should only be recorded if it helps in controlling and testing the efficient working of a process.

ii) Information availability. Information should be readily available once the event has occurred, given due allowance for time to collate, etc.

iii) Accuracy. Information recorded should be accurate. The accuracy must be sufficient to allow any subsequent decisions based on the information to be correct.

The points made above should be borne in mind when studying present and any proposed methods.

Each enquiry received in 3b generates various records apart from the original letter Any office procedure should allow an enquiry to be followed through all stages of the answering process at any time. The basic information required is as follows: the receipt of the enquiry, what stage has been reached in a reply, how it was answered and the information for administration purposes e.g. Invoice Number. The information needed for these purposes will now be examined.

Part 2. Information needed

The following information is required if a coherent procedure is to be established bearing in mind it must be sufficient for current purposes as well as providing relevant information in the event that it needs to be referred to again:

a) A record of each enquiry that comes into the enquiry bureau and whether kept or passed to another branch.

b) For any enquiry that is to be answered, need to know it's current status (whether pending, being dealt with or completed), the person dealing with it and a file reference for completed correspondence.

c) Information to calculate the overall charge, if one is to be made.

d) Information to enable study of the nature of enquiries.

In order to fulfill these objectives the following information is needed.

A. Administration

A.1) Enquiry number. This is needed simply to identify each separate enquiry. Consecutive numbering implies chronological order and this should normally be the order in which enquiries are answered.

A.2/A.3) Customer name and address. For back reference purposes.

A.4) Date on customer's letter. This is often quoted in later correspondence. Also, this is when the customer views the start of the enquiry.

A.5) Date received. The start of the enquiry for 3b. It indicates how long enquiry has been in the enquiry bureau's custody.

A.6) Customer's reference. Used in later letters by customer and in some of 3b's correspondence.

A.7) Dates when correspondence is sent to and returned from typing. This will provide a continuous monitoring of the progress of an enquiry within Met O 3b and provides a physical record if typing delays occur.

A.8) Invoice number. Each charged enquiry is given one of a set of consecutive invoice numbers This set is given to 3b by Met O 4 annually.

A.9) Date sent. Effective closing of the enquiry handling by 3b.

A.10) Who answered the enquiry. Implies responsibility for the enquiry answer.

B. Charge data

To calculate the final charge several items should be accounted for.

B.1) Telephone calls. Frequently customer's letters are imprecise and, occasionally, ridiculous. To clarify points of uncertainty, 'phone calls are often made. Where this arises from customer's negligence then a charge should be made for staff time and cost of the call. If though, the call is made to entice more spending by the customer, no charge should occur.

B.2) Programming and computing costs. Charges are made per computer unit for data extraction. The programme development costs involved are defrayed over a period (Abbott, 1982).

B.3) Typing time. A staff time charge.

B.4) Photocopies, A 'materials' charge.

B.5) Total cost. The sum of items B.1 to B.4

B.6) V.A.T. Charged on most enquiries.

B.7) Total charge. The sum of total cost and V.A.T.

C. Data for enquiry analysis

To improve enquiry revenue and to improve the 3b service, it will be necessary to know more about the character of enquiries than at present. The following are needed for this purpose and also for back-reference purposes.

C.1) Enquirer's profession. Needed for several purposes including selectively aiming new services, monitoring changes, etc.

C.2) Purpose. Similar points as under profession. It may also affect any charges raised in the light of the purpose for which the data are to be used.

C.3) Data requested. What customer wanted or thought most appropriate.

C.4) Data given. What 3b thought most appropriate.

C.5) Enquiry Classification Code. The ECC is fully described in another chapter. It's main aim would be to aid retrospective enquiry analysis; it is provisionally suggested as a six-figure code.

Nearly all of these data are noted in some form at present, as explained in the next section.

Part 3. Present methods of enquiry logging in 3b and comparisons to other branches

In 3b, data is currently recorded at four points. These are:-

a) Accounts book. The purpose of this is to ensure Invoice numbers are issued consecutively.

b) Inquiry book. To note the receipt and completion of enquiries.

c) Customer card file. This is an alphabetical index of customer names for back-reference purposes.

d) Charge Sheet. This contains charges as noted by the present classification.

The information recorded in these, is examined further in Appendix 1. These documents are intended to deal with the following stages in enquiry handling.

a) When an enquiry arrived.

b) Whether it is being dealt with or not.

c) Whether it has been answered.

d) Finding past correspondence.

e) Revenue earned according to present classification for the Annual Report.

The compilation of these records is best explained in chronological order following an enquiry from receipt to completion.

Each day approximately fifteen to twenty written enquiries arrive. Each is date-stamped and an enquiry number (consecutive) written on it. The letters (including telexes) are then placed, in chronological order, on the pending file. Depending on the number of enquiries being received at any time and data availability, a delay varying from 1 to 5 weeks can occur before they are removed from the pending file to be answered.

Most people make the entry to the 'Customer card File' at the time that the enquiry correspondence is removed from the pending file, but some make this entry at the time of enquiry completion. Whatever reply is appropriate, the text is handwritten and then sent via internal mail to the Typing Pool. So that the invoice can be typed at the same time as the correspondence, the element of typists time in the charge is currently estimated.

In drawing up the invoice, the invoice number will be taken from the 'Invoice Book', and at this time the relevant entry is made to that book.

Once the typing is completed and the reply ready for posting, the 'Charge sheet' is filled in, ie, the charge made for the enquiry is noted in the appropriate column.

The enquiry can now be regarded as 'completed' or 'dead'. Copies are kept of the invoice, the letter of reply and the original enquiry. Data given are usually noted on the enquiry. These are all placed on the file chosen by the person handling the enquiry. These files hold the correspondence of 'active' enquiries (ie. those currently being replied to) and 'closed' enquiries. Each person has a selection of personal files, held on the desk, each file covering a different topic of the present classification, e.g, commercial, legal, etc. In the front of each file is a list of enquiries held within; once full the file is placed in the filing cabinets available.

The enquiry logging methods of Met O 3c (Marine section), Met O 8a (Agricultural Meteorology) and Met O 8c (Rainfall enquiries) have been examined. Their enquiry services differ in the following respects: Met O 3c handle fewer enquiries, but
4a(HC) each one brings in more revenue: 8a handle few enquiries and these are mostly from within the Met. Office: 8c handle approximately one-third the number of non-routine enquiries that 3b handle (in 1981 the total number of written and telephoned enquiries was 4,354 and 12,774 in 8c and 3b respectively).

Met O 3c use an 'Enquiry Form' system whereby each enquiry received (written, telephoned or telexed) has a form started. A fuller description is given in Appendix 2. 3c benefit from having enquiry paperwork handled by the Personal Assistant to the PSO in charge. The P.A. keeps a 'Transit Book' which notes every movement, in and out, of correspondence, and also a 'Job Book' equivalent to 3b's 'Inquiry Book'. The 'Job Book' lists jobs in enquiry number order. Filing is on a customer basis, though some miscellaneous files are kept by each person.

Met O 8a also use an 'Inquiry Form' method but only for non-Met office enquiries. As the latter are few, then a 'clip-on-the-wall' method is adequate in acting as a pending file. Files are numbered in a hierarchcal system based on subject of correspondence; if in retrospect an enquiry is needed and the file number is not known, then the correspondence may be found in one of several files.

Met O 8c do not use an 'Enquiry form' method. They have similar procedures to 3b, in that booking methods are used. Three main differences exist. Firstly, several pending files are kept, on a subject basis. Secondly, a customer card file is not kept for every non-routine enquiry. Reliance is placed on the customer to quote a Met. Office reference which allows past correspondence to be found. Thirdly to find correspondence an 'Enclosure number' system is used. Each piece of paper placed on file is numbered and the number on the invoice noted in the Enquiry Book. Filing is on a subject and chronological basis. One drawer holds all correspondence for a year.

Part 4. Criticism of present Office procedures

The purposes of a 3b office procedure have been noted already, at the beginning of part 2. Data on the arrival and completion of an enquiry are handled reasonably well by the present methods. The periods between and after these points are not. Several shortcomings in the system will now be noted.

As previously mentioned, the time at which the customer card index is completed, with regard to each enquiry, is not uniform. Some entries are made when the enquiry is taken from the pending file, others when the enquiry is completed. In the latter instance, locating an active enquiry can be a problem if it is needed: it will not be on the pending file, the only reference to it being the arrival entry in the enquiry book. Knowing the whereabouts of an enquiry should be possible at all times. Relying on memory only works when people are present.

The entries in the Customer card index cause further problems. An example can be given, where correspondence with 'National Nuclear Corporation Ltd' was needed. An entry under that title was found, but this was to an earlier enquiry. When advised to look under 'UK Atomic Energy Authority', the enquiry came to light. This implies that experience is needed to operate what appears to be a simple system. This is a case where a broader heading ('Nuclear') was used. However, another example is where a private individual referred to past correspondence giving no reference, and that previous correspondence could not be found. The conclusion is that the Customer card index is at times not fulfilling it's intended role.

At present, the only financial analysis possible is of data entered on the charge sheet. Statistics can be calculated but it would all have to be done by hand. Indeed, this is how it is done in preparing the Annual Report figures. Such number-crunching work is suitable for computer application. Any new procedure should ensure that the charge data is recorded on computer hardware, so that programmes can use the data. Another problem of the present data is that the charge figures are divorced from the original enquiries: enquiries that produce e.g, exceptionally returns can not be traced. Also, detailed interpretation is limited by the present classification.

Filing is an area of office procedure which has got out of hand. The 3b file classification is a mixture of subject and personal ie, each person has a file on each subject (eg legal enquiries). This has led to too many 'personal' files, which tend to clutter people's desk tops. The filing cabinets are used only to store 'completed' enquiry files and this leaves a good deal of space not in use.

If more use of the cabinets was made then there would be more working room available on desks.

Finally, but most importantly, information is repeated in too many places. Appendix 1 shows this to be the case. For example, invoice number appears in the accounts and enquiry book: file number is in both of these and on the customer card index. This repetition is intended for cross-referencing, where file number is the key to finding correspondence.

Part 5. Proposed Office procedures

The following is a suggested method of office procedure. In many ways it is a modification of present methods, but the emphasis is on placing information in one place. The better parts of methods from other branches are included. Also, the system is designed as a step towards the use of office 'information technology' (see separate chapter).

In the proposed system of office recording there will be four main entry points for information relating to an enquiry. These are:

a) A Transit book.

b) An Enquiry Log form .

c) A Customer card index

d) An Invoice book

The Transit Book will serve to record the arrival, the removal from the pending file of the enquiry and by whom, and the completion of an enquiry. It thus indicates where the enquiry is to be found at any time. The suggested layout is shown in Fig 2.1.

The Enquiry Log is a form holding all the required information pertaining to an enquiry. It is the main record of an enquiry. The proposed methods record a minimum of information on other forms. Other records serve to locate the Enquiry Log. An example is shown in Fig 2.2.

The Customer card index is little changed from before and is kept as a back-up in finding past correspondence, using name and address. It is thought that information on the cards should be less dense than at present to enhance clarity in reading. A more formal layout is shown in Fig 2.3.

The Invoice Book, Fig 2.4, serves the purpose of selecting invoice numbers consecutively and as a reference to correspondence with the invoice number as an index. It is therefore very similar to the present Invoice Book, but with less information recorded.

In this collection of documents the key piece of information is the Enquiry Number. This is used as the main cross-reference between these documents and is intended to lead to the Enquiry Log form. Each document will be examined by the example of following an enquiry from it's arrival to completion of the reply.

The Transit book layout is shown in figure 2.1. All correspondence that passes through 3b would be noted here. Upon arrival, the customer name and address and 'action' columns would be completed. In examples A) and C), the correspondence has been kept and is 'filed' ie, placed on the pending file. In example A) an acknowledgement has been sent and the date noted. (see chapter 6). In example B) the enquiry was sent to Met O 8c for answering. Thus this enquiry has no enquiry number, whereas A) and C) have consecutive numbers.

The enquiry number is a six-figure group. The first two figures represent the year e.g. 81 for 1981, the last four figures are a number assigned consecutively starting at one each year on 1 Jan. For example, enquiry number one in 1981 would be Enquiry Number 810001, number 2236 in 1982, 822236.

For each enquiry retained in 3b, an enquiry log is drawn up. An example is shown in Fig 2.2. The person receiving mail would complete the following sections: enquiry number, previous reference (if any), Customer name, address, date on letter date received and customer reference. The remainder will be completed by the person handling the enquiry as it is processed.

Dashes on the Enquiry Log imply that one character is placed on each space. This information is to be extracted by the punching service and placed on the respective card and in the appropriate column number as shown in the middle column. The asterisks on the far left are to highlight items to be punched. The aim is that this information will be available to a computer programme to analyse this data, for example, prepare financial analysis for the annual report or use the Enquiry Classification Code (see chapter 3) in analysis of past enquiries. Continuous lines indicate data to be recorded but not punched for computer use.

Once the enquiry is removed from the pending file, then the fifth column of the Transit book would be initialised and dated. This implies that the enquiry is being answered, who is responsible and therefore upon whose disk the correspondence will be found (Example C, Fig 2.1). When the enquiry is finished, column six would be dated, implying correspondence would be found in a central file (see below).

On the invoice that is drawn up and on the letter of reply the reference given would be the enquiry number preceded by the letters 'EN' to avoid confusion e.g. in telephone conversation. Thus the 1927th enquiry in 1982 would be given a reference of EN821927 in outside correspondence. If Met O 4 or a customer ring the 'EN number' can be asked for. The number will allow retrieval of the Enquiry log sheet which gives comprehensive information. If the original documents are still wanted the file number will be on the log sheet.

The enquiry being completed the Customer card index would be filled in. The layout is shown in fig 2.3, with an example entry. It is similar to the current

index but with fewer entries per card and use of specific columns. Also more than one line per entry would be used if needed, to give greater clarity. A new set of cards should be started each year to aid data access.

Entries should be by first word of a trade name or a surname, ignoring prepositions. Thus Mr G Eve would be filed under Eve., 'I.C.I'. under I 'The National Nuclear Corporation' under N for National.

If a company changes name, as with our National Telephone Service, then the previous name could be noted on a changes card for each letter, as in fig 2.5.

Each invoice is allocated a number, one of a set decided annually by the accounting branch, Met O 4. This number will be taken from the Invoice Book which consists of two columns. The left hand columns holds the consecutive invoice numbers, the right hand column the enquiry number to which the invoice pertains. Therefore, given an Invoice number only as a reference, then the log sheet can be found. Again, if the original documents are required then the file number will be on the log sheet.

This leaves the question of filing. First of all, the enquiry log sheets once drawn up, should reside with the enquiry in the pending file. When the enquiry is removed to be answered, the log sheet is held by the person answering the enquiry in a 'pocket file' or the like. Thus, each person in the enquiry team has a file holding log sheets of enquiries being answered by that person. Thus if that person is absent the state of the answer in preparation (eg, at typing pool), can be found easily by other people.

Once all sections of the log sheet are completed, they would be placed in a central position and would be grouped in numerical order and by year. If kept in a filing cabinet, cards could be inserted between these forms to split into groups of say, 200 and to keep in reasonable condition. Batches of 50 could be sent to P.C.K every 14 days, after completion, to extract data for the database.

Actual correspondence should only be in the vicinity of a desk when 'active'. Once completed, all paperwork should be assigned to a central filing system, available to all. These documents should be grouped by type (commercial, educational) and also all documents of one year together.

Part 6. Computing

An integral part of the system described above is a computer programme and the storage to hold data extracted from the enquiry log sheets (fig 2.2). At the minimum, charges and type would be needed with dates to replace the role of the Charge sheets. However, it would be far better if all information placed in dashed lines was extracted. Detailed enquiry analysis on the basis of the Enquiry Classification Code could take place. Enquiry searches could lead to printout of the stored information in answer to questions. This is exemplified in the Chapter on the E.C.C.

These concepts are based on the present Met. Office computing system. Arguments are given for the introduction of 'Information Technology' in enquiry work in chapter 7. It should be realised here, that most if not all of the above Office procedure and probably more could be assigned to a services dedicated mini-computer via VDU, using computer systems that are available now. The procedures described should be seen as a transitory step in this direction not the aim itself.

Customer	Address	Action	Acknow-ledgement & Date?	Taken from Pending File by	Completed	Enquiry Number
Example A G Eve & Co	13, High St, Totnes	Filed	18/3/81	12/4/81 AP	16/4/81	811726
Example B S Andrews Ltd 19 Mar 1981	215, The Mall W.1	Sent to 8c	-	-	-	-
Example C I.C.I.	Middlesborough	Field	-	26/3/81 CM		811727

Figure 2.1 The Transit Book Layout

Examples A, B and C are referred to in the text

ENQUIRY LOG

	CARD 1	
ENQUIRY NUMBER	1- 6	------
PREVIOUS REFERENCE		------
CUSTOMER	7-35	----------
ADDRESS	36-80	----------

	CARD 2	
LETTER DATED	1- 8	--/--/--
RECEIVED	9-16	--/--/--
CUSTOMER REFERENCE	17-28	----------
PROFESSION	29-50	----------
CATEGORY	51-52	--
	CARD 3	
PURPOSE	1-35	----------
DATA WANTED	36-70	----------
E.C.C.	71-76	------
	CARD 4	
TELEPHONE)		____ MINS AT £ ___.___ PER MIN = £ ____.____
)		____ MINS AT £ ___.___ PER MIN = £ ____.____
DATA GIVEN	1-35	----------
TIME TAKEN		____ HOURS AT £ ___.___ PER HOUR = £ ____.____
PROGRAMMES USED)		
)		
COMPUTER COSTS		_____ UNITS AT £ ___.___ PER UNIT = £ _____
DATE SENT TO TYPIST		--/--/----
RETURNED		--/--/----
DATE SENT TO TYPIST		--/--/----
RETURNED		--/--/----
TYPISTS TIME		_____ HOURS AT £ . PER HOUR = £ ____.____
PHOTOCOPIES		____ AT £ . PER SHEET = £ ____.____
TOTAL COST		£ ____.____
V.A.T. AT 15%		£ ____.____
CHARGE	36-43	£ ------.--
INVOICE NUMBER	44-49	
DATE SENT	50-57	--/--/--
ANSWERED BY	58-61	----
FILE NUMBER & INFORMATION		----------

Fig 2.2 Proposed Enquiry Log Form

I			
Customer	Address	Letter dated	Enq. number
I.C.I.	Teeside Indstrl Est. Middlesborough	15.3.81	811727

Fig 2.3 The Customer Card Index

Invoice numbers	6001 – 6050			
I.N.	E.N.		I.N.	E.N.
6001	811726		6026	
6002	811703		.	
6003	811732		.	
.			.	
.			.	
.			.	
.			.	
.			.	
.			.	
.			.	
.			.	
.			.	
6025			6050	

Fig 2.4. Invoice Book page layout

I.N. : Invoice Number
E.N. : Enquiry Nunber

P – Change of name	
Present name	Previous name
British Telecom	Post Office Telecommunications

Figure 2.5 Customer Card Index – Change of Name Card

AM

ENQUIRY CLASSIFICATION

1. Enquiry analysis and classification

The Climatological Bureau (3b) 'office procedures' are dealt with in more detail elsewhere. Here attention is on enquiry classification and analysis. At present no easily accessible data exists to make detailed studies about 3b enquiries. A method of providing such a data base is proposed.

The only method available for quantifying enquiries is from the Monthly Charge Sheets (see chapter 4). From this the number of enquiries per month in each of eighteen classes can be found. The individual charges for each charged enquiry noted there, form the only base for any financial study. An example is shown in Appendix 1.

The present classification (table 3.1) has several deficiencies. The 18 classes represent an amalgam of purpose and profession with greater emphasis on the latter. Some classes are too broad in description (commerce), some too narrow (e.g. (Sport)). Furthermore, approximately 90% of charged enquiries fall in 4 of the 18 classes. Analysis of past enquiries shows this to be overuse of particular class descriptions, covering up differences in enquiries, rather than showing little variation in professional origin and purpose of enquiries. Therefore, this classification does not form an adequate base for enquiry analysis. The following is a suggestion for a new classification and analysis system.

2. Enquiry Classification Code

Any classification is a condensed representation of the original enquiry. The present classification is adequate for the purpose of the Met Office 'Annual Report', but records too little information to allow more detailed study. Those enquiries that would awnser, e.g. 'How many road planning enquiries were there in a given period'? could not be found without a great deal of manual searching, because the present classification is too simple and because no record of the actual enquiries assigned to a classification is kept.

The following 'Enquiry Classification Code' (hereafter, ECC for brevity) aims to give a flexible scheme of enquiry description. The ECC is based on 'key-words' derived after a study of over 100 past enquiries. The ECC is based on the premis that each enquiry can be broken down into three components:

a) The profession of the enquirer.
b) The purpose of enquiry.
c) The data requested.

Profession, purpose and data (requested) will be called the classifications. Each classification has been broken down into a number of descriptive groups (see tables - 2, 3 and 4) each of which is assigned a code number.

Enquiries often cross rigid boundaries; a commercial company's solicitor could at the moment fall into the Commercial or Legal category. To overcome this problem, two groups may be selected from each classification if necessary, giving a maximum of six groups to describe the enquiry.

A possible ECC will now be built up. The enquiry is from the Fertiliser research section of an Oil Company. 'Oil Company' would be taken as the profession and the groups used to describe this would be 'Commercial' and Energy', codes 04 and 13. These codes are taken, within each class, in numerical order (see below).

Thus: 0413 _____ _____ _____ represents space for other classes.

The profession codes are put in the first two ECC positions.

Fertiliser research would be noted in the purpose class as 'Agriculture' and 'Research', codes 02 and 06 respectively. These are inserted in positions three and four of the ECC. Thus:

0413 0206 _____

The data requested may have been 'weather' and in particular 'humidity', group codes 01 and 07. These are placed in positions five and six of the ECC; the completed code is therefore:-

0413 0206 0107

The above ECC can be decoded as profession: Commercial, Energy
purpose : Agriculture, Research
data requested: Weather, Humidity

If in any one class, one group adequately - describes the enquiry, then one only need be used, e.g., Solicitor as profession (group code 10): 1000 _____ _____. If no information can be discerned (most applicable to purpose class) then the class can be left blank, i.e. 0000. So Solicitor who asks for a particular days weather, not stating a purpose would be classifed as: 1000 0000 0100.

With a short code, the ECC gives far more description than the present classification does. Compare the information in the ECC of the Oil Company example given above, to that enquiries present classification as 'Commercial'.

3. Use as a data base for research into customer enquiries: the 'Search Code'

Describing each enquiry by an ECC merely as an alternative to the classification now used, would have no advantages whatsoever. However, it has many advantages if used as the basis of an enquiry retrieval system, which selected enquiries that answered questions on the nature of 3b's customers. A computer programme has been written (MØ3.ASRCELIB(XSEARCH): a listing is given in Appendix 7 to match a 'Search Code' to the ECC's. The programme is also described in Appendix 7. The end-product from the programme is a list of enquiries which included in their ECC the specified groups of the 'Search Code'. In Figure 3.1 the output from a search using a SC of 0505 are shown e.g. any mention of Building/Construction in the Profession class of the ECC. Enquiry numbers of enquiries selected by the SC are listed. The programme has been developed to show how the ECC and SC can be matched. The results are also shown of a search for 'Building' and 'Weather Limits' in the Purpose class. A selection of the ECC data tested is shown in Fig.2.

The 'Search Code' (hereafter SC for brevity) uses the same group code numbers as the ECC. As the programme stands (2.3.1982), any two of the three classifications can be examined. Thus, as with the ECC, there are six possible spaces for numbers to be inserted but only a maximum of four can be used. The remaining pair are left blank.

In each class to be examined there are three options of code specification:

a) A specified pair may be looked for e.g. Building Consultant, 0305. This would be placed in positions one and two, indicating profession classes of the ECC to be matched to the SC.

b) One group only, in the first position of a class, the information is placed. e.g. Solicitor, profession code 10. Again, the information is placed in positions one and two, i.e. 1000.

c) Search for the same code in the first and second positons of a class, e.g. any reference to Building/Construction in profession class; 0505 is thus used as the SC in positions one and two.

As any two classes can be examined (though at present only by a FORTRAN logical 'AND' between the two classes), the above options can be repeated for a second class if desired, given that the assigned positions are respected. Thus for example a SC representing all Building Consultants who asked merely for 'the weather', would be: 0305 0000 0100. Note the purpose class is not searched as it is defined as 0000.

4. Developments and problems of such a system

The ECC and SC system is put forward as a suggested method of achieving the aforementioned aims. It is accepted that developments will be needed and possibilities are now mentioned.

a) Groups.

The groups may well need to be changed, but should not be too broad or narrow in their descriptive usefulness. For example, should climatic memoranda be given a group of their own or engineering be separated from building and construction? Future possibilities in enquiries should try to be envisaged. Thus flexibility needs to be obtained but without a proliferation of groups; a maximum of 20 groups in each class is suggested.

b) Classes.

The ECC boundaries of Profession, Purpose and Data requested may best be removed allowing a set number of positions in the ECC. The emphasis would then be on 'keywards' e.g. energy; they would appear just once in an ECC, whereas now several groups are repeated in both Profession and Purpose classes.

As the class definition stands, it may be that 'data given' may be added as a class, if the class boundaries were kept.

c) Output format.

The programme has been developed to show how coded enquiries can be retrieved by matching a search code to a classification code. At present only the enquiry numbers (designated for testing purposes only) are listed, giving a reference to enquiries that answer the SC. In its final form it is envisaged that output would include Customer name and address, a brief summary of the enquiry, the charge and invoice number as well as enquiry number.

5. Objections to putting into practice

The code is relatively simple and should soon be learnt. Once familiar, it takes between 10 and 60 seconds to construct an ECC for an enquiry.

The ECC would be recorded on the 'Enquiry Log' form as set out in chapter 2. Eventually, it would be hoped that application of 'Information Technology' will further ease the construction and recording of an ECC. For example, a flow diagram of questions may be displayed on a VDU to help construct the ECC.

6. The justification for such a system

Application of such a system of enquiry classification, would give much improved knowledge of the information wanted by customers, the purpose it is being put to and a better definition of the customers profession. With such analyses becoming possible, the development of present customer services in financially rewarding directions could take place with greater chance of success. New services could be developed after, e.g. examination of data requests matched to purpose. The present lack of detailed information about customers will prevent efficient development of services and especially any consultancy service. Any such development would at best be an 'educuated shot in the dark' in the present state of knowledge.

Table 3.1 The present classification

The present enquiry classifications are:)

Agriculture

Building design

Commerce

Drainage

Educuation and Literary

Flooding

Heating and ventilation

Industrial and manufacturing

Legal

Medical

Press

Research

Sport

Transport and communications

Upper air

Water Supplies

Miscellaneous, known.

Miscellaneous, unknown.

At present, approximately 90% of enquiries are placed within the Building, Commerce, Legal or Research categories. Further discussion is presented in chapter 5.

Table 3.2 the Profession Class of the Enquiry Classification Codes

The following are the groups in the profession class, the group codes and professions allocated to these groups.

CODE DESCRIPTION

01. Meteorological Office.

Any enquiry originating from within the Met. Office.

02. Agriculture.

To include horticulture and biological sciences eg, Zoology and Botany, but not Medicine. (see below).

03. Consultancy.

Includes advisory role (including e.g. environmental services to local authority), management, services.

04. Commercial.

Includes trade association but not Building and Construction and associated trades. (see below).

05. Construction/Building.

Includes Civil Engineering, Engineering, Surveyors, Architects.

06. Broadcasting and Media.

Includes Press and Telecommunications.

07. Educuational.

Includes Schools, University and Polytechnics. Students.

08. 'National' Government. (see 09 also)

Includes EEC, Forces, Welsh Office, Home Office, Treasury, Civil Service (Health & Safety Exec, PSA, Central Office of Information, but not Met. Office (see 01)).

09. 'Local' Government. (see 08 also)

Local and Health Authorities. Science Research Councils, Research Councils (e.g. Building Research Establishment). 'QUANGO'S', e.g. Potato or Milk Marketing Board. Water Authories. (For Met. Office see 01).

10. 'High Street' Solicitor

Solicitor as sole practice, not part of another concern.

Table 3.2 (continued)

11. Legal (not 'High Street' Solicitor, see 10).

Legal profession and similar. Solicitors attached e.g. to commercial companies. Also, Loss adjusters, Insurance companies.

12. Sport and Leisure.

Includes recreation, personal comfort ('where to live').

13. Energy.

Where energy is part of the profession it should be mentioned e.g. Oil Company. If it is an Oil Company Solicitor then the Legal aspect should be emphasised at the possible expense of 'Energy' as a 'keyword'.

14. Private Individual

15. Library, Literary.

Includes bookdrafts.

Table 3.3 the Purpose class of the Enquiry Classification Code

CODE DESCRIPTION

01. Meteorological Office.

Description as per Profession.

02. Agriculture

Description as per Profession.

03. Transport — Road

04. Transport — Non-Road, including marine activity

05. Construction and Building

Description as per Profession.

06. Research.

Including Investigation (see also 07), Exploration.

07. Damage Investigation

08. Legal — Court Case mentioned and no more information.

09. Legal — Insurance Claim and/or Accident.

10. Legal — Court Case with Insurance Claim and/or Accident Mentioned.

08 is a legal default; if profession is Solicitor or Legal but no purpose is mentioned use 08 in purpose class.

11. Contract Extension

12. Weather 'Limits'

Includes Commercial tendering, Feasibility Study, Siting, Weather windows/restrictions, Design.

13. Energy For example oil company research, fuel, solar panels, windmills etc.

14. Bookdrafts, Publications.

20. Other, Known

Table 3.4 the Data requrested class of the Enquiry Classification Code

Where more than two elements of weather are specifically mentioned, see group 14.

CODE DESCRIPTION

01. Weather/Weather Conditions.

02. Rain/Precipitation. (Not snow, see 03).

03. Snow/Ice/Frost.

04. Wind/Gale.

05. Storm/Thunderstorm/Lightning.

06. Ground Conditions. Includes soil temperatures, Grass minimum temperatures, Road conditions.

07. Humidity/Dew Point/Wet Bulb Temperature.

08. Temperatures. (see also 06, 07, 09).

09. Maximum/Minimum Temperatures.

10. Climatic Averages/Climatic Memoranda.

11. Solar Radiation/Sunshine/Upper Air Data.

12. Visibility/Fog/Cloud Cover

13. OTHER. Includes Soil moisture deficit, Pasquill Stabilities, Station data availability, Opinions, Return periods, Degree-day data.

14. 'MORE THAN 2 CLASSES OF ABOVE SPECIFICALLY REQUESTED! In this situation use this group code and in the other group code available in the ECC data class seek to emphasise the unusual e.g. Solar Radiation or Visibility.

```
JJ IS PRINTED FOR TEST PURPOSES-TO INDICATE THE SUBROUTINE USED


*****  ENQUIRY SEARCH NUMBER  1  *****

SEARCH CODE
  5  5      0  0      0  0

NUMBER OF ENQUIRIES MATCHING SEARCH CLASSIFICATION =  32  JJ=  3
INVOICE NUMBERS
     2     3     5     6    11    12
    13    14    15    18    19    21
    25    26    28    29    30    31
    32    33    34    35    38    41
    49    52    65    69    72    73
   113   114

*****  ENQUIRY SEARCH NUMBER  2  *****

SEARCH CODE
  0  0      5  5      0  0

NUMBER OF ENQUIRIES MATCHING SEARCH CLASSIFICATION =  18  JJ=  6
INVOICE NUMBERS
     2     3     5    12    13    24
    30    31    33    35    38    49
    52    59    69    70    72    73

*****  ENQUIRY SEARCH NUMBER  3  *****

SEARCH CODE
  5  5      5  5      0  0

NUMBER OF ENQUIRIES MATCHING SEARCH CLASSIFICATION =  15  JJ= 12
INVOICE NUMBERS
     2     3     5    12    13    30
    31    33    35    38    49    52
    69    72    73
```

Fig. 3.1 Three Enquiry Searches

In the first search, any record of Building or Construction as a profession has been used as the Search Code. Thirty two enquiries had this record in their Enquiry Classification code. The enquiry numbers (devised for the test) are listed.

In the second search, any record of Building or Construction as a purpose has been used as the Search Code. Eighteen enquiries fulfilled this requirement.

In the third search, it was desired to find a record of Building or Construction as both the profession and purpose. Fifteen enquiries fulfilled this requirement.

126 Enquiry Classification Codes were used in this test.

THE FOLLOWING NUMBERS ARE THE ENQUIRY CLASSIFICATION CODES.
THE FIRST COLUMN IS THE ENQUIRY NUMBER
THE 2ND & 3RD COLUMNS ARE THE PROFESSION GROUPS
THE 4TH & 5TH COLUMNS ARE THE PURPOSE GROUPS
THE FINAL TWO COLUMNS ARE THE DATA REQUESTED GROUPS

COLUMNS 1	2	3	4	5	6	7
1	4	13	6	13	4	0
2	3	5	5	12	4	0
3	5	6	5	12	11	0
4	4	13	5	0	8	13
5	5	13	5	12	3	4
6	4	5	6	0	7	0
7	4	13	6	0	9	0
8	4	0	6	0	11	14
9	4	0	4	0	4	0
10	2	4	2	12	2	13
11	3	5	0	0	7	8
12	5	0	5	12	2	0
13	5	0	5	11	1	0
14	3	5	3	12	1	14
15	4	5	5	12	5	0
16	3	0	0	0	2	14
17	20	0	20	0	1	14
18	5	0	11	0	1	0
19	3	5	0	0	10	13
20	3	9	2	6	10	0
21	3	5	0	0	4	0
22	3	4	12	13	4	0
23	8	0	0	0	8	0
24	4	13	5	12	4	10
25	3	5	3	11	9	10
26	3	5	3	12	8	14
27	7	0	2	0	8	14
28	3	5	0	0	13	14
29	3	5	3	12	2	9
30	5	0	5	11	3	14
31	3	5	5	7	4	0
32	5	0	3	12	10	0
33	5	0	5	12	9	14
34	5	11	7	10	4	0
35	3	5	5	12	9	14
36	7	0	6	0	11	0
37	7	0	6	0	13	0
38	5	7	5	6	11	13
39	7	0	6	0	4	0
40	7	13	6	0	10	0
41	5	5	5	12	2	14
42	8	13	13	0	13	0
43	8	11	9	0	3	13
44	8	11	9	0	1	5
45	1	0	0	0	13	0
46	1	0	0	0	4	0
47	5	9	5	12	4	10
48	9	0	3	0	8	9
49	5	9	5	6	8	11
50	8	15	14	0	13	0

Fig 3.2. A selection of the 126 Enquiry classification codes used in testing XSEARCH.

4. ENQUIRY SERVICE INFRASTRUCTURE

In this chapter various subjects are considered, these being the necessary functions and support activities which go to form an efficient information service.

1. Organisation of material

The data used by the enquiry bureau is in a disorganised state. Firstly, this is in the sense that no list of available data exists. An 'outsider' to 3b cannot follow any prescribed method to find out what data is available and then locate or obtain it easily. Some lists of the data within a file are kept with the data inside the file, but the broad knowledge of what data is available or can be obtained, is a matter of experience.

Therefore it would be desirable to have a catalogue of the data available and frequency analyses possible, to cover both manuscript and computer format data. References to sources of data sometimes requested but outside the Office's scope eg, astronomical data, could also be included. If data was held on disk or tape, then reference to how to access it should be given, eg. cross-referencing to programme documentation. This catalogue should be kept in a prominent position and encouragement given to use the data listed.

Such a catalogue would be a step towards streamlining of office procedures. To experienced and inexperienced alike, a list of available data and its whereabouts would be very useful.

The 'disorganised state' also applies to the storage of manuscript data. This is held in many ways from loose collections in box and clip files to published tables in brochure format. As part of an overhaul of the enquiry service, the storage of the manuscript data should be examined, especially with regard to easier retrieval of the data. Once any changes were carried out and a data catalogue in force, consideration should be given to delegating the responsibility of 'curator' for the data to a particular person.

The location of data is discussed in another section of this chapter.

Further texts to support enquiry work should be acquired. The atlases used at present are within this ambit of background material. Given the amount of correspondence involved in enquiry work, a dictionary and thesaurus would be a valuable initial contribution to the establishment of an enquiry bureau library. Books and offprints covering office procedures, enquiry techniques and applied meteorology should form part of this library.

Trade magazines should also be reviewed. "Office Equipment Index" taken by the library each month and then discarded, could be sent to 3b prior to disposal. This would increase awareness of changing office equipment and methods and their application to 3b's work.

There is a need for a 'Manual of Enquiry Bureau Procedures', to lay down what are the accepted office procedures, the rulings on charges (where no charge should be made, court appearances, etc), dealing with complaints and anything else to do with the handling of enquiries. This should serve to settle any problem but if the problem still needs to be resolved then the decision should then be included as an update. The writing of such a guide would also bring about the questioning of current methods.

2. Staff training

The Met Office College organises a wide range of courses for Met Office staff, many naturally covering meteorological work. Computing is another subject covered well as many staff are involved in such work.

At present, there appears to be little teaching of public relations, a field in which many staff in the Services side of the Office are involved. The nearest approach to such work given in course syllabuses (Professional Training Courses, Appendix 3) is techniques of forecast presentation.

There is a need for staff training in public relations and this can be taken up with the College. Subject matter should include telephone manner, letter writing techniques (ie. the clear drafting of replies), layout of diagrams and tables, other forms of presentation, exhibition work, the image of the Met Office that should be conveyed, lecture technique and any other topic where communication of ideas are involved. It is envisaged that such courses would at most be a week long, dependent on content. They would be of use to people throughout the Office.

To exemplify the need for such a course, an instance occurred where a member of staff (from the Services side) gave a lecture at the Met Office College. An overhead projector was used. The lecturer looked down and spoke in the direction of the viewfoil rather than to the audience. Unfortunately, he also stood in front of the lens thus eliminating the display from the screen.

As well as having the skills of dealing with the public, staff involved in public contact should also have a broad knowledge of the current work within the Office. Enquiry staff are given the responsibility of being the interface with the public for the work of the Office and it is only right that they should be given an appreciation of the work in other branches. The 'items of interest' circulated are helpful as are the occasional lectures given for the benefit of Met Office staff. However, the former are too brief and don't convey the development of projects, and the latter are possibly too specialist. Methods, possibly short lectures, to convey an overall appreciation of the work of a branch should be considered.

A greater appreciation is required of the computer's abilities. This need not be to the level of programming (though JCL knowledge might be helpful in running standard programmes) but should include an explanation of the problems that may delay the return of output, the justification for the purchase of any machine, etc.

3. Liaison

a) Within branch.

A desire that has been stated several times during the period of this study is for greater programming development for enquiry services. Work needs to be done, for example, on frequency tables, diagrams and graphics, automation of design wind speeds and in general, greater utilisation of the Cosmos system.

The computing group are mostly concerned with data handling. To get the suggested programme development for enquiry work requires a programmer to be given the responsibility of 'enquiry service' programming, who would then work in close liaison with members of 3b. This may be a temporary or additional responsibility, but once started further ideas for development are likely to become apparent and there may then be a need for a programmer as a permanent member of the enquiry team.

There is a need to put climatic research to practical use in answering enquiries. For example, stations can be placed in groups on the basis of similar climate. Using this knowledge it may be better in some cases not to use the nearest station to a particular location (specified in an enquiry) but a more appropriate station within a climatic area eg, the nearest coastal station for a coastal site of enquiry.

At present all enquiries are made because somebody perceives a distinct need for climatic data. If the enquiry service is to gain both greater and more diverse custom, then uses of climatic data will have to be suggested to potential users. First of all, however, a better understanding of the current state of enquiries is needed. This includes up-to-date financial analysis, numbers of enquiries by type and the purposes the data is put to. With an improved state of knowledge of this nature an expansion of the current information services could be planned. However, research is also needed in the field of applied climatology, so as to develop new applications for climatic data. The application of climatic information to the building trade is being well studied within the branch. Similar work should take place on applications in other areas, one possibility being industrial concerns.

Research on customer satisfaction and information wanted needs to be carried out. This would probably involve new data derived from such sources as customer questionnaires. Controlled experiments could be carried out: a set number of building enquiries could have services leaflets enclosed in the replies, with the same number not receiving such leaflets. Decisions on the effectiveness of such leaflets at generating further enquiries, could then be made.

In conclusion there needs to be better liaison within Met O 3. The enquiry service needs greater programming support in order to make the best use of the Cosmos facilities. Also, there should be better practical application of results from the climatic research group. Furthermore, research in the field of applied climatology needs to be carried out to improve the enquiry service.

b) Inter-branch

Methods of logging enquiries vary from branch to branch, as outlined in Chapter 2. Met O 3b have received enquiries that have been passed on incorrectly from other branches (some examples are given below). In both cases, current practices serve to emphasise the independent approach of each branch to its allocated enquiries.

In the first section (organisation of material) a catalogue of available data in Met O 3 was proposed. It would be of even greater use, if descriptions of climatic data held in other branches were listed. This information need not be as detailed as that on Met O 3 data; a brief description of the data and a person to contact may be enough. If such catalogues were adopted by other branches, written in the same format, then agreement may be reached on updating the shared information, of data available, at agreed periods. Such work may allow the application of the most appropriate data to an enquiry. Duplication of effort may also be avoided.

A co-ordinated approach to customer services and enquiries should exist amongst services branches. Agreement should be reached on experiments with Prestel and other electronic technology to achieve the best utilisation of such facilities. Co-operation in exhibition displays is needed so that the branch most involved with an exhibition, also takes material to illustrate the services of other branches. For example if several display panels are set up to highlight the Automatic Telephone Weather Service, then one panel should highlight other services by the display of leaflets or other methods as appropriate.

This co-ordinated approach should reveal itself in such items as headed notepaper and other design work. It would greatly help the internal handling of enquiries if agreement could be reached upon common filing methods, reference methods, logging of enquiries and other office work. There would be economy of scale in such standardisation. There would be economy of effort also, as any enquiry particulars would be recorded in a manner comprehensible to all people involved in enquiries.

Liaison is desperately needed so that people from one branch who are in contact with the public know what other branches can do. During the first four months of this study a file marked 'Misdirected Enquiries' was set up in 3b. Fifteen entries were considered worthwhile entering in this file to illustrate the lack of knowledge at outstations of 3b's responsibilities. A few examples are presented here:-

i) Telephone call received 4 January 1982.

A person had been referred to 3b by Southampton Weather Centre. The information wanted was Southampton averages, which it is reasonable to expect to have been held by SWC. In such cases could Weather Centres not give local information?

ii) 16th Dec 1981.

Around the 12th December there was heavy snow and low temperatures in Britain. Lloyds of London rang London Weather Centre to find out more about this wintry spell. LWC passed Lloyds on to 3b.

3b could not be expected to answer this enquiry as December data would not be received until early January. Quality-control work would delay its valid use until mid-January. Firstly, Weather Centres should know this limitation on recent weather information in 3b. Secondly, is advice on recent weather the province of Weather Centres or not?

iii) 1st Feb 1982.

A lady rang Plymouth Mountbatten for information. Plymouth gave their available data over the 'phone, but a written report was needed for insurance purposes. She was correctly referred to 3b, but unfortunately had been told that the report would be issued on the basis of a telephone call. Also the lady became further distressed that charges would be made, which Plymouth had not informed her of.

(A telephone call was made to Plymouth, who accepted the two points of criticism).

iv) 29th March 1982.

A call was received from a very worried secretary working for a London solicitors. She had been to London Weather Centre on the 24th March and had been told that a statement of weather in Dover on 9th June 1980 could be provided by LWC. Collection had been arranged for 29th March.

When she called for the statement, she was told that the data was from outside the LWC area and that she would have to contact Bracknell. This confusion was aggravating enough for the customer but the problem was made worse by the information being needed in court on 31st March.

3b sent a manuscript reply at 4 pm, 29th March, by-passing the usual requirement for a written request.

Several points arise from the above examples. Firstly, it would seem that some fellow members of staff seek to pass on enquiries, when they could be expected to answer them with their own information. Alternatively, some enquiries are passed on when it should be known that Met O 3b cannot answer the enquiry. Naturally, some customers should be referred to 3b, but the possible charges should be mentioned, as the need for written confirmation.

Secondly, inconvenience is caused to both HQ staff and more importantly to the customer and this may result in loss of custom. If bad service is given, a customer is less likely to come back and also the tale of the bad service will be related to other members of the same profession. The near-monopoly of the Met Office should not be a cause for bad service.

It is very important that each constituent part of the Met Office realises that in dealing with the public, their work will be the basis on which an image will be formed in the customer's mind. The unnecessary passing of an enquiry to another section does not help to form a good image.

4. Office Services

i) Typing and photocopying.

In the Met O 22 survey carried out in 1979, just over one-half of all work typed in the typing pool came from Met O 3. This statistic in itself provides a substantial argument for having typists working within the enquiry service. If typists were assigned to such work, the familiarity with enquiries would hopefully improve the replies given. By working within 3b the originator of the draft reply would be on hand to clarify misunderstandings. Importantly, the frequent transport of draft replies to and from the typing pool would be eliminated, thus shortening the 'production line' in distance and time. Letters would no longer sit in 'IN' and 'OUT' trays waiting for messengers. Also, the only typing that would delay enquiry work would be other enquiry work, not internal memorandum or reports such as this.

An argument that may be used against the siting of one typist within 3b would be absence on holiday and illness. In such instances, the present system could be returned to without undue problems. If two typists were assigned to 3b enquiry work, as may be justified by the volume of work, then such absence would present less of a problem.

A further reduction in the carriage and waiting for processing of documents, would be to install a photocopier into 3b. This would achieve a faster service as documents would be photocopied when and how wanted. There would no longer be time spent on instructions on what to copy.

A machine versatile to cope with the majority of 3b photocopying, but not all possibilities would be needed. Decentralisation to 3b of all its own photocopying is not being advocated. A 3b photocopier would be well utilised as many replies involve some photocopying.

(A quirk of Met Office organisation is that the hydrometeorological enquiry service, who handle fewer enquiries, already have a photocopier at their disposal).

The removal of the need to send draft letters and photocopying to the typing pool should result in improved production of replies to customers. No time would be lost in the transfer to the typing pool nor in waiting for non-enquiry typing to be completed. Corrections needed should be fewer as would the amount of written instructions needed. Overall the time taken on each enquiry should be reduced as fewer enquiries would be being dealt with by any one person at a time; the necessary correspondence would be cleared faster for any particular enquiry.

ii) Other requirements

Met O 3 as a branch suffer from a lack of space. The marine section in fact, is situated in a separate building one-quarter of a mile away from the rest of the branch. In common with other branches in the Napier-Shaw wing, the working area is inflexible due to the alignment of small rooms along a long corridor. This constrasts sharply with the current trend for 'open-plan' layouts designed to ease movement of both people and goods.

Despite these problems of space to work in, more effective use could be made of the available rooms. Each of the following suggestions for changes should not be taken in isolation but considered as possibilities that could be combined to produce better use of the allocated rooms.

Room 138, the main 3b enquiry room, will be considered as an example, but any changes could equally apply to other rooms used by Met O 3. Firstly, as mentioned in section 1, the way in which reference papers (tables of data, etc) are held should be re-considered. This applies not only to the containers used but also to the cupboards. At present, there is approximately 15 feet of cupboards lining a wall. It may prove useful to remove these and replace them with shelf units set back-to-back in pairs and at right-angles to the wall. One pair is likely to be enough. This would release wall space for other purposes, eg. repositioning desks if desired.

There is a surfeit of metal cupboards and filing cabinets, especially in the centre of the room. Those that are not in use should be removed and those remaining should be moved from the centre. This would make the room less cramped and allow freer movement within the room.

The removal of the wall cupboards would allow the establishment of a small area for customer presentations. This could be placed in the inside corner away from the door, separated off by free standing screens. Pin boards could be wall mounted to display relevant tables and diagrams. A pull-down viewing screen for an overhead projector could be set up. If such consultancy business flourished, the establishment of a Prestel terminal should be considered. This would be an impressive display of the use of

electronic 'information technology'. The receiving set need not be permanent, in that it could be shared with other branches who may want occasional use of such a facility.

What is needed is imaginative thinking. Civil Service storage methods seem to rely heavily on metal cabinets. Some form of lockable cabinet is of course necessary for security purposes but there is a distinct lack of flair in making use of office equipment other than metal cabinets with lockable doors. For example, free standing circular units with several levels of racking to hold papers vertically, may allow greater storage in a small space. Mesh racking with pigeon holes may be a more compact method of storing stationery. Telephones can be removed from desk tops by placing them on movable supports extending from a desk edge: wall-mounting phones (not necessarily put on walls) may be more useful than the traditional 'phone.

The greatest office problem confronting the enquiry bureau is ease of access to data, in particular the manuscript data of 'Metforms'. This is all held in rooms other than the enquiry room and this considerably punctuates the flow in production of a reply. For example, the most recent Metform data is held a few yards from the enquiry desks but to get to it involves opening two doors (2 each way of course) and crossing to the room opposite. If this journey is made between 9.00 am. and 1.00 pm and a customer from Manchester is kept waiting on a telephone line, that customer is paying 4.3p per 12 seconds involved (May 1982: Long distance peak rate telephone charge). Alternatively, at the current HSO capitation rate of £27.37 per hour, a 30 second journey would be charged 23 pence to a paying customer.

A reorganisation of rooms to give greater ease of access to the data would bring about a more functional layout to the enquiry bureau. The question should be asked about the recently quality controlled data: who has the greatest need for these records, the quality control team or 3b?

Changes in rooms need not be one only way of improving the ease of movement. Putting doors into dividing walls, possibly sliding doors to save space, is another method. If the enquiry bureau remained in room 138, a door through to the adjacent store of older metforms would give greater access to the raw commodity of 3b's work - information.

Conclusion

Various ways of improving the working environment of the enquiry bureau have been put forward. Each should be considered more fully to assess the possible benefits. The overall aim is to bring about the facilities that will make it easier and so cheaper in terms of staff time, to produce a reply.

The nature of replies is considered in Chapter 6. Further changes in the enquiry bureau office are considered in Chapter 7, where attention is given to 'information technology'.

JB

CHAPTER 5

ENQUIRY STATISTICS

The results of several analyses are presented. These include the number of enquiries per month over the period January 1979 to February 1982: the charges made in 1981: the delay in answering enquiries: how old the requested data is: a hypothetical study of time spent answering telephones.

1. Data sources

The monthly charge sheets have been the data source for the analyses of charges and the number of enquiries. The number of written (both charged and non-charged) and telephoned enquiries are noted there, according to the present enquiry classification (listed in Table 3.1), for each calendar month. Each charge made is recorded on this sheet. A full description is given in Appendix 1.

To obtain simple descriptive statistics of these charges, both overall and by each classification, for each month and longer periods, required the handling of the order of 3000 data for a year. The only practical method of doing this, was to put the data into 'computer-compatible' form. This was a laborious task involving the transcribing of each charge (1981 only) along with associated identifying, month and enquiry type numbers onto computer-coding forms. These were then punched onto cards by the Punching Service. The point to be noted is that to obtain simple descriptive statistics of one year's financial data involved a good deal of manual effort as the charges were only recorded on paper. The Enquiry Logging System proposed in Chapter 2, overcomes this problem.

With the cooperation of members of Met O 3b, a small number of enquiries were followed from receipt to completion. This survey is referred to as 'Present Enquiries' and from it the data on delays in answering enquiries has been extracted.

A 'Past Enquiry' survey i.e., of completed enquiries, combined with the Present Enquiries provided data on how far back requests for data go, i.e., 'how old' was the data requested?

2. Enquiries received

In Figure 5.1, the top graph depicts the total number of enquiries received in each month from January 1979 to February 1982 inclusive. Three further graphs illustrate the monthly totals of telephoned, written and charged enquiries in the same period. The annual totals of these enquiries are listed in Table 5.1; the annual number of charged legal and charged building enquiries are also noted.

The annual total of enquiries varied from approximately 11,000 to 14,000 during the 3 years 1979 to 1981, of these the majority of enquiries are telephone enquiries (62%, 73% and 73% in successive years). No telephone enquiry is, of course, revenue earning, though later written enquiries may ensue from telephone calls, which can then be revenue earning.

Fig 5.1 shows the high monthly variability of total enquiries received, especially so in the spring and summer of 1980. The monthly variations in total enquiries are well reflected in the monthly variations of telephone enquiries. This indicates that variations in total enquiries are strongly linked to the variations in numbers of telephone calls received.

From the financial standpoint, the number of written enquiries is the most important. As can be seen from Table 5.1 written enquiries form a small part of all enquiries received; in 1979 37% of the total, falling to just over a quarter of all enquiries in 1980 and '81. The top graph in figure 5.2 indicates the high variability of the number of written enquiries handled each month.

Not all written enquiries generate income however. For example, in general, educational requests are not charged when only a small amount of data is given. Over the three years 1979 to '81, just over 80% of written enquiries have been charged. From the opposite point of view nearly one-fifth of all written enquiries do not generate any revenue. Overall, the percentage of all enquiries (i.e., written and telephoned) that earned revenue was 30.6% in 1979 falling to 21.8% in 1980 and 21.9% in 1981. Table 5.1 also illustrates that the actual numbers of charged enquiries have fallen in these 3 years.

The final two columns of Table 5.1, illustrate that the majority of revenue-earning enquiries are within the 'legal' classification and that the legal and building classes together account for just over four-fifths of all charged enquiries. This is further brought out in Figure 5.2, where the monthly numbers of legal and buulding charged enquiries have been plotted alongside the monthly totals of all charged enquiries.

Regression lines based on the relevant monthly data have been calculated and superimposed on the graphs in Figure 5.2. This has also been done in Figure 5.3, a plot of the monthly totals of telephone calls. The slopes and intercepts of the regression lines are listed in Table 5.2. January 1979 is taken as month number 1 and so, for example the regression line for all charged enquiries is:-

Number of enquiries = -2.67 x month number +308.7.

In all cases the degrees of freedom were (1,36). At the 1% confidence level the F(1,36)ratio is 7.40. In all four regression lines, the Variance Ratio exceeds this F-number and it can therefore be said for each regression line that there is a significant change in enquiries per month over the period January 1979 to February 1982.

In the number of total charged and building charged enquiries there is a notable downward slope, but the slope of the charged legal enquiries is only slightly downward. The slope of the telephone enquiries is notably upward.

In summary the number of telephone calls (again, these are non-revenue earning) has been on the increase in the past 3 years but the number of charged enquiries has been in decline over the same period. The number of charged building enquiries has been decreasing by approximately 46 enquiries a year but the number of legal enquiries has shown a lower downward trend of 2.4 enquiries per year.

The decline in charged building enquiries may be ascribed to the depressed state of the industry. Legal cases involving meteorological influences can be expected to not be directly influenced by the economy. No reason can be put forward for the increase in climatic telephone enquiries; greater use is being made for forecasts of the Automatic Telephone Weather Service each year and the noted increase in calls to 3b may be a side-effect of this interest, though this is only speculation.

Variations in the number of enquiries handled in a period will be affected by public and private holidays affecting both the number of enquiries sent and the number of people available to answer them, the complexity of the answers and markedly by the level of staffing in the enquiry bureau. Despite these mitigating factors, it is of concern that telephone calls have been increasing but the number of revenue-earning enquiries has been decreasing over the past three years.

In Figures 5.4 and 5.5, the 3-monthly moving average data (equally weighted 3-point mean), are presented for the same class breakdown as Figures 5.2 and 5.3. This was done in an attempt to find evidence of seasonal trends. In the graph of all charged enquiries, the indications are of a spring (or 'post-winter') peak of activity declining to a lull late in the year. This was also the case in 1980 and 1981 for legal charged enquiries, but not in 1979. From the building trade it may have been expected that a post-winter peak, associated with claims for extension-of-contract causes would have occurred, but there is no indication of this or any other seasonal trend.

3. The charges made

BMDP statistical software was used to produce descriptive charge statistics and diagrams. Programme 5D was used to obtain histograms and cumulative histograms, which due to their size are placed in Appendix 8. 2D was used to obtain detailed data description, including frequencies. A summary of this information is given in Tables 5.3 and 5.4.

In Table 5.3, data for each month and for the whole year of 1981 are listed. In 1981 there were 2797 charged enquiries, the total income coming to nearly £66,000 (inclusive of VAT). Charges had a very large range from £1.00 to £4177.95, however 80% of charges fell within the limits of £11.50 to £25.30, with a median value of £17.25. The large proportion of legal and building enquiries is also highlighted.

In Table 5.4, comparison is made for the main categories, between the percentage of total charged enquiries and the percentage of total income generated by those enquiries. This is from 1981 data, the charges including VAT.

As noted above, legal enquiries constituted 66.0% of all charged enquiries, but brought in just under half of all income. The deciles listed indicate the narrow band of charges for legal enquiries compared to Commerce, Building and Research categories. The median values however, are all very similar.

The low number of legal enquiries with 'high' charges is also brought out by there being only 3 enquiries charged more than £100. There were 39 such charges overall in 1981. The Research category especially attracted a disproportionate number of such charges, with 13 of the 39.

Figure A8.1, in Appendix 8, illustrates the marked peak within the £16 to £20 band with most charges clustered around this peak. (The compressed upper end of the charge scale should be noted. The class interval is £4 to £60, then an interval of £10 to £100. Two further classes, £100 to £300 and over £300 are then displayed). It can be seen from the cumulative percentages that 8.1% of 1981 charges were greater than £28 and 1.4% were more than £100.

When the histograms of all 1981 charges for a particular type are examined, it becomes apparent that legal enquiries are clustered about their median (£17.02), with only 1.9% of legal enquiries being charged more than £28 (Figure A8.8). In contrast the

figures for Building, Commerce and Research enquiries earning more than £28 were 17.5%, 26.9% and 33.7% respectively. (Figures A 8.3, A 8.4 and A 8.11); the respective actual numbers were 89, 27 and 29. Analyses for the months of May and August are shown in Figures A 8.16 and A 8.17, which also show the large proportion of low charges made to legal enquiries, with building providing the higher earning enquiries.

Figures A 8.18 to 23 are cumulative histograms for all 1981 charges and the more numerous classes. The fact that legal enquiries provide the bulk of all enquiries but are mainly lower revenue earners and that higher-earning enquiries come mainly from Building, Commerce and Research sectors is again pinpointed.

4. Delay in answering enquiries

Forty enquiries were followed from arrival to completion, these forming the 'Present Enquiry' survey. The number of working days involved in answering each was calculated and Figure 5.6 is a histogram of this data. The range of working days involved was from 8 to 30, with a median of 19. 19 working days implies a customer will wait about 5 weeks before receiving an answer to a written enquiry.

The number of days involved are well-distributed with no indication of clustering around an average. It is accepted however that 40 enquiries is a small sample and that the sample was taken in the period following severe weather in December and January, which had produced an increase in enquiries. Despite this it indicates that at a minimum a customer is not getting a reply within less than 2 weeks and that **nearly half of the replies will not be received by the customer within 4 weeks of arrival at the Met Office.**

5. Data requests - how old is the data requested?

By combining the 'Past Enquiries' and 'Present Enquiries' surveys a sample of 164 enquiries was obtained. The information requested was examined and placed into one of several groups. If the request was for data, then the length of time between the receipt of the enquiry and the date of the observations required was noted (the earlier date of a period of observations being used). Thus several time spans from less than 1 month to more than 6 years were noted. The number of requests for climatological averages and for opinions, station listings, etc were also recorded. The results are shown in Figure 5.7.

Of the 164 enquiries in the sample, 17.0% requested data more than 2 years old, but this falls to 11.6% of enquiries when data older than 3 years is the criterion. Climatological averages requests (e.g., wind frequencies) and 'non-observational' enquiries (e.g., design wind speeds) accounted for 31.1% of the sample enquiries. Just under a third (32.9%) of the enquiries requested observational data from within the past 6 months.

6. An examination of time spent on telephone calls

The only information with regard to telephone enquiries is the monthly number of phone calls, recorded on the monthly charge sheet. To gain detailed information would have required work akin to a 'time and motion' study, using stop watches to obtain mean duration of phone calls, etc. Such work was considered outside the scope of this study.

The following calculations are based on several "working assumptions": these are various estimates which are generally considered reasonable.

In 1981, 9356 phone calls were noted. The calls recorded are considered to be an underestimate of the actual number of calls received. Let the assumed number of incoming calls be 10,000 in 1981 (an increase of 7% on the figure recorded).

Telephone calls vary in length naturally, but they rarely last less than 2 minutes or more than 10 minutes. So, 5 minutes is considered a reasonable average duration of a phone call.

If it is taken that 6 people are actively engaged in answering phone calls and that they answer the same number each, then:-

10,000/6 = 1667 phone calls were answered by each person in 1981.
1666 x 5 = 8330 minutes
8330/60 = 138.8 hours spent answering phone calls by each person each year

Now, with 52 weeks there are 260 working days in a year. Allowing 30 days absence, this implies 230 working days in a year. With a 37 hour week this implies 1702 working hours per year.

138.8/1702 = 8.15% of the working time was spent answering telephone calls. As telephone calls are an interruption to other work in progress, it can be said on the basis of the above assumptions that about one-tenth of a person's time is taken up by incoming phone calls.

7. Discussion

Though only simple descriptive statistics have been presented it is believed that it is the first time such analyses have been available, at least since 1979 when some similar data featured in a Met O 22 report. Several points have been highlighted.

With regard to the total number of enquiries handled, three-quarters in the past two years have been telephone enquiries. These are not money-earning, though they may lead on to a revenue-earning written enquiry. On the basis of the monthly totals of phone calls in the past three years, there is an upward trend in numbers of calls answered. With 10,000 calls a year, it is suggested that about 10 per cent of employee's time is taken up with incoming phone calls.

In the past two years written enquiries have accounted for a quarter of all enquiries. However only 4 out of 5 written enquiries generate any revenue. Consideration should be given to see if a greater proportion of written enquiries should be charged. In contrast to telephone enquiries, there is a downward trend in the numbers of charged enquiries and this should not allow room for complacency.

The range of charges made has been very wide, but overall, 80 per cent of charges fell within the limits of £11.50 to £25.30 (inclusive of VAT) and the median was £17.25. Thus the majority of 3b's enquiries earn small amounts of income, **with only 39 charges being more than £100.**

This is due to legal enquiries forming a large proportion of 3b's charged enquiries: 51.1% in 1979, 63.8% in 1980 and 66.0% in 1981. In nearly all legal enquiries a short statement of weather at a particular time and place is wanted.

Such enquiries are repetitive, short tasks and thus low revenue earners because charges are based mainly on the staff time involved. As legal enquiries form the bulk of 3b work, the true cost of providing the service should be assessed.

Enquiries from the building trade are the second largest group both in terms of numbers and income. In 1979, building enquiries constituted 30.2% of charged enquiries, which had fallen to 17.0% in 1981. Actual numbers had fallen more dramatically, from 1046 in 1979 to 475 in 1981. In 1981, 21.1% of revenue was earnt from building enquiries.

Histograms have been presented to illustrate the distribution of charges. The higher income enquiries are mostly within the Building, Commercial and Research categories.

The 'Present Enquiry' survey has shown that the customer is likely to encounter a wait of about 4 weeks before receiving a reply. This is far too long and is accepted as being so within 3b. It will always be desirable to have a backlog of enquiries due to variations in demand, but the enquiry service should aim to achieve getting a reply to the customer in 10 to 14 days from receipt. This is likely to be a far more acceptable period to customers.

In the winter of 1981/82 there were considerable delays in return of material from the typing pool. These delays no longer exist due to the assigning of 'Commercial Priority' to enquiry work. It is therefore from within 3b that efforts to speed replies must now come. Some suggestions for improving the service are made in chapter 4.

Though approximately four-fifths of enquiries received are by telephone, it is estimated that one-tenth of time is spent on answering these calls. There has been an upward trend over the past three years in monthly numbers of phone calls. If this were to continue, action may have to be taken to cope with or curtail the number of phone calls, especially if efforts are made to increase and improve written enquiries, which can be charged.

Finally, with regard to data requested, it would seem that data more than 3 years old could be downgraded in accessibility without great inconvenience being caused.

Year (Calendar)	Total number of enquiries	Telephone	Written	Charged	Legal Charged	Building Charged
1979	11190	7006 (62.6)	4184 (37.4)	3463 (82.8)	1771 (51.1)	1046 (30.2)
1980	14108	10286 (72.9)	3822 (27.1)	3069 (80.3)	1959 (63.8)	596 (19.4)
1981	12774	9356 (73.2)	3418 (26.8)	2798 (81.9)	1844 (65.9)	475 (17.0)

TABLE 5.1 ANNUAL TOTALS OF 3b ENQUIRIES

Figures in brackets are percentages; in the telephone and written columns, of the total enquiries in each year: in the charged enquiries column, of written enquiries: in the final two columns, of the total number of charged enquiries.

Enquiry Type	Slope	Y-Intercept	Variance Ratio
All charged	-2.67	308.7	17.28
Legal, charged	-0.20	157.7	110.30
Building, charged	-1.94	95.4	30.70
Telephoned	+7.40	604.9	8.55

TABLE 5.2 REGRESSION LINE COEFFICIENTS

Data used: monthly totals of enquiries Jan 1979 - Feb 1982, sample size equals 38. F-ratio, (1,36) degrees of freedom, = 7.40 at 1% confidence level.

Month	N	Medicine £	% Legal	% Building	Maximum, £	Minimum, £	Decile, 10 £	Decile, 90 £	Income (inc VAT) £
January	243	16.01	70.8	17.7	80.50	1.00	11.27	22.58	4126.80
February	293	17.25	60.4	21.8	4177.95	1.50	11.25	23.85	9616.26
March	293	17.25	66.9	18.8	362.25	1.61	10.58	27.37	6046.79
April	257	17.71	62.6	17.1	185.02	1.00	9.20	28.31	5290.58
May	244	17.25	63.9	17.2	557.75	1.00	11.50	26.25	5315.10
June	240	18.40	58.3	20.4	580.75	1.00	11.50	27.42	5481.06.
July	252	17.62	70.2	14.7	184.00	2.00	12.88	26.45	5529.43
August	206	16.64	77.2	9.2	86.25	2.00	12.19	23.00	3732.69
September	164	17.25	67.1	15.2	408.61	2.25	13.22	23.00	3980.28
October	183	17.25	70.5	14.2	2587.50	2.00	12.65	23.51	7179.23
November	225	17.25	64.4	19.1	425.50	2.35	11.50	26.45	5367.21
December	197	16.86	63.5	14.2	350.10	2.00	11.50	21.85	3964.25
All Year	2797	17.25	66.0	17.0	4177.95	1.00	11.50	25.30	65,628.68

TABLE 5.3 ANALYSIS OF 1981 3b ENQUIRY CHARGES (INC VAT)

'% Legal' and '% Building' are the respective percentages in those categories of the total number of charged enquiries ('N').

Enquiry Type	% number of charged enquiries	% of income	Median (£)	Decile 10 (£)	Decile 90 (£)	Number of enquiries charged more than £100
All	100.0	100	17.25	11.50	25.30	39
Legal	66.0	49.3	17.02	12.65	21.85	3
Commerce	5.5	12.5	17.25	5.75	34.50	5
Building	17.0	21.1	17.94	11.50	34.50	11
Research	3.1	9.0	20.00	3.45	172.50	13

TABLE 5.4 1981 3b ENQUIRY INCOME: WHERE THE INCOME CAME FROM BY TYPE

$Decile_{10}$: the value below which 10% of charges occurred.

$Decile_{90}$: as $decile_{10}$, but 90% level.

Figure 5.1 Monthly enquiries (total, telephoned and charged), Jan. 1979—Feb. 1982

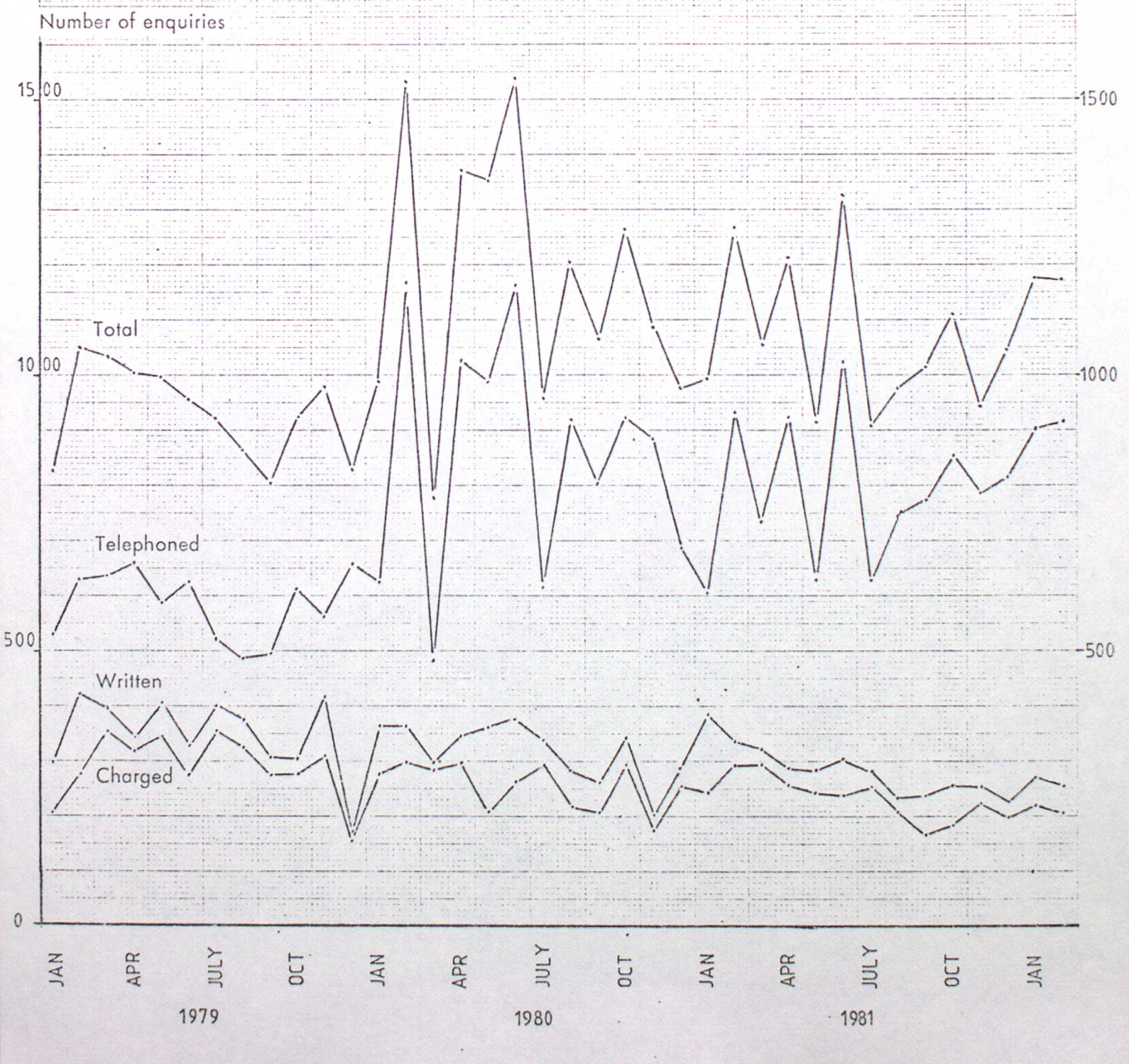


Figure 5.2 Monthly charged enquiries (total, legal and building), Jan. 1979—Feb. 1982

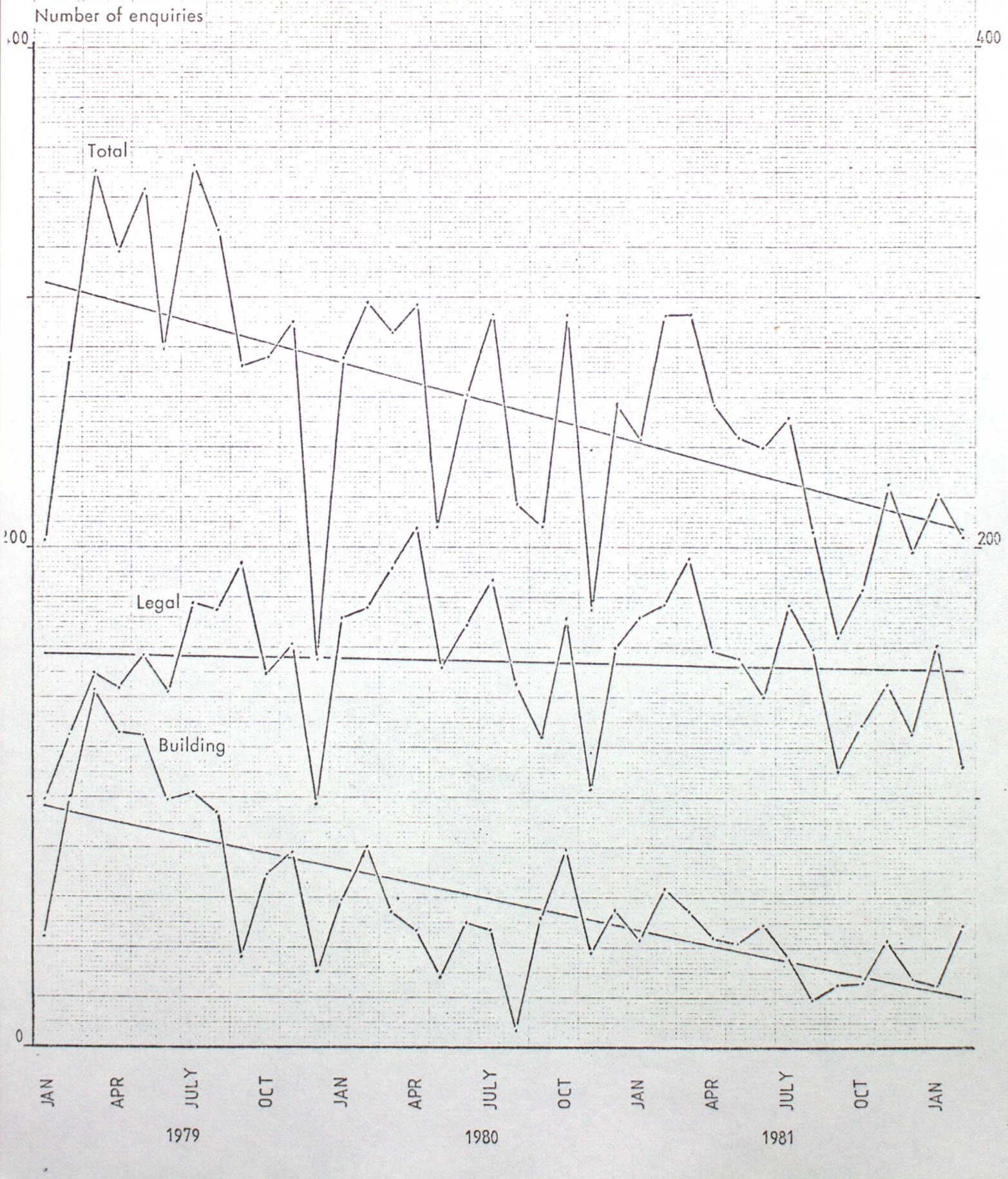


Figure 5.3 Monthly telephone enquiries, Jan. 1979—Feb. 1982

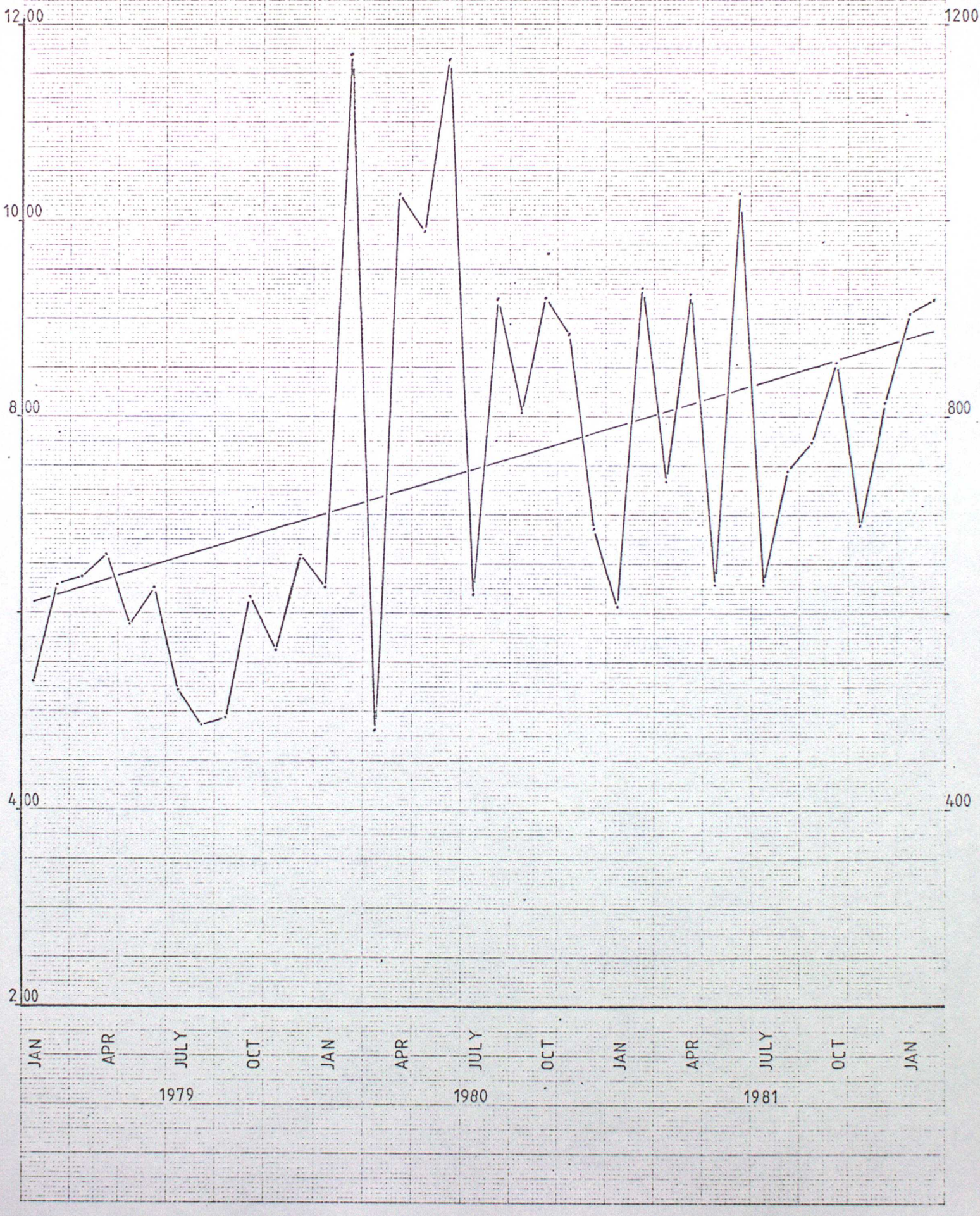


Figure 5.4 3-point running mean of monthly charged enquiries (total, legal and building), Jan. 1979—Feb. 1982

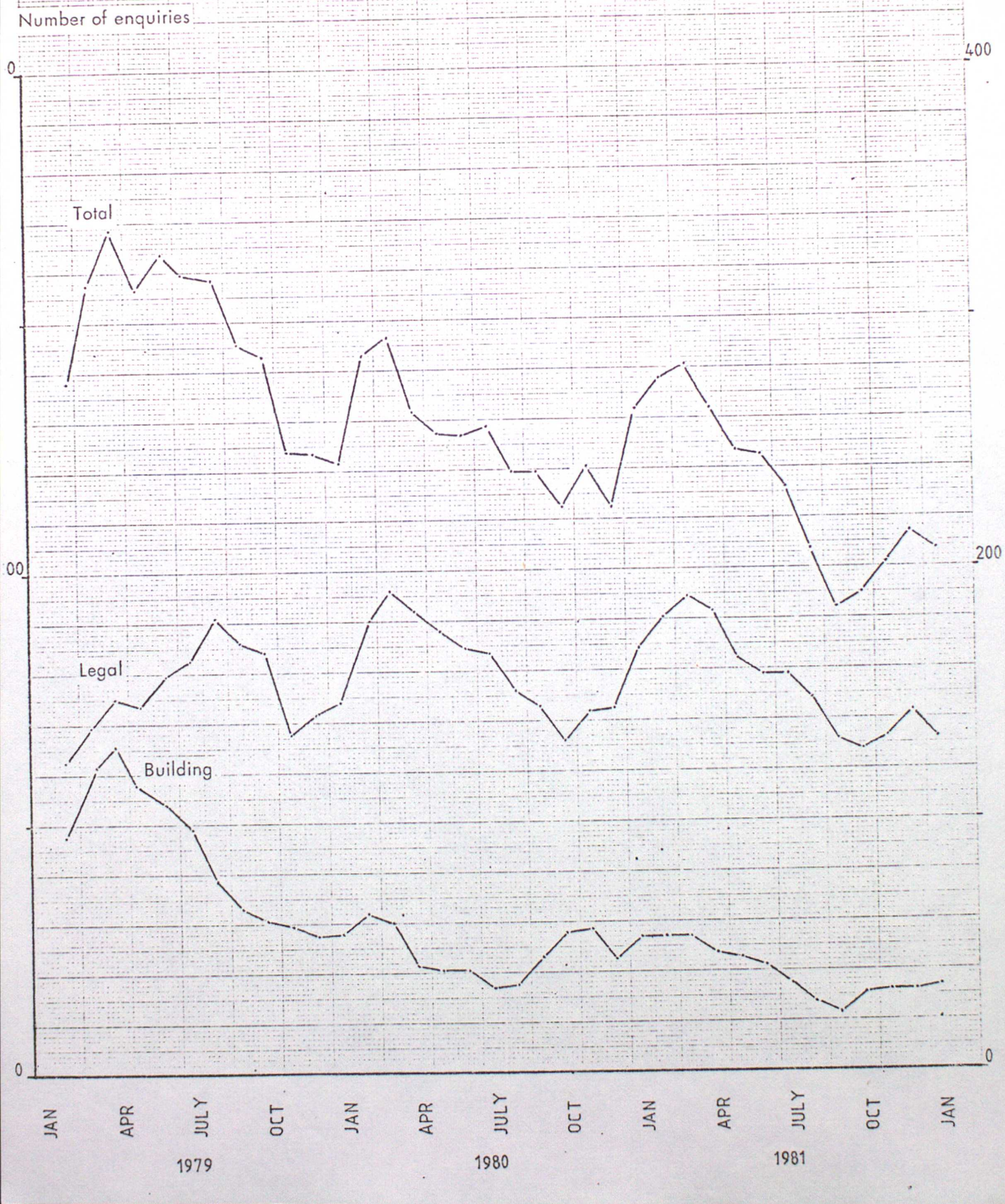


Figure 5.5 3-point running mean of monthly telephone enquiries, Jan. 1979—Feb. 1982

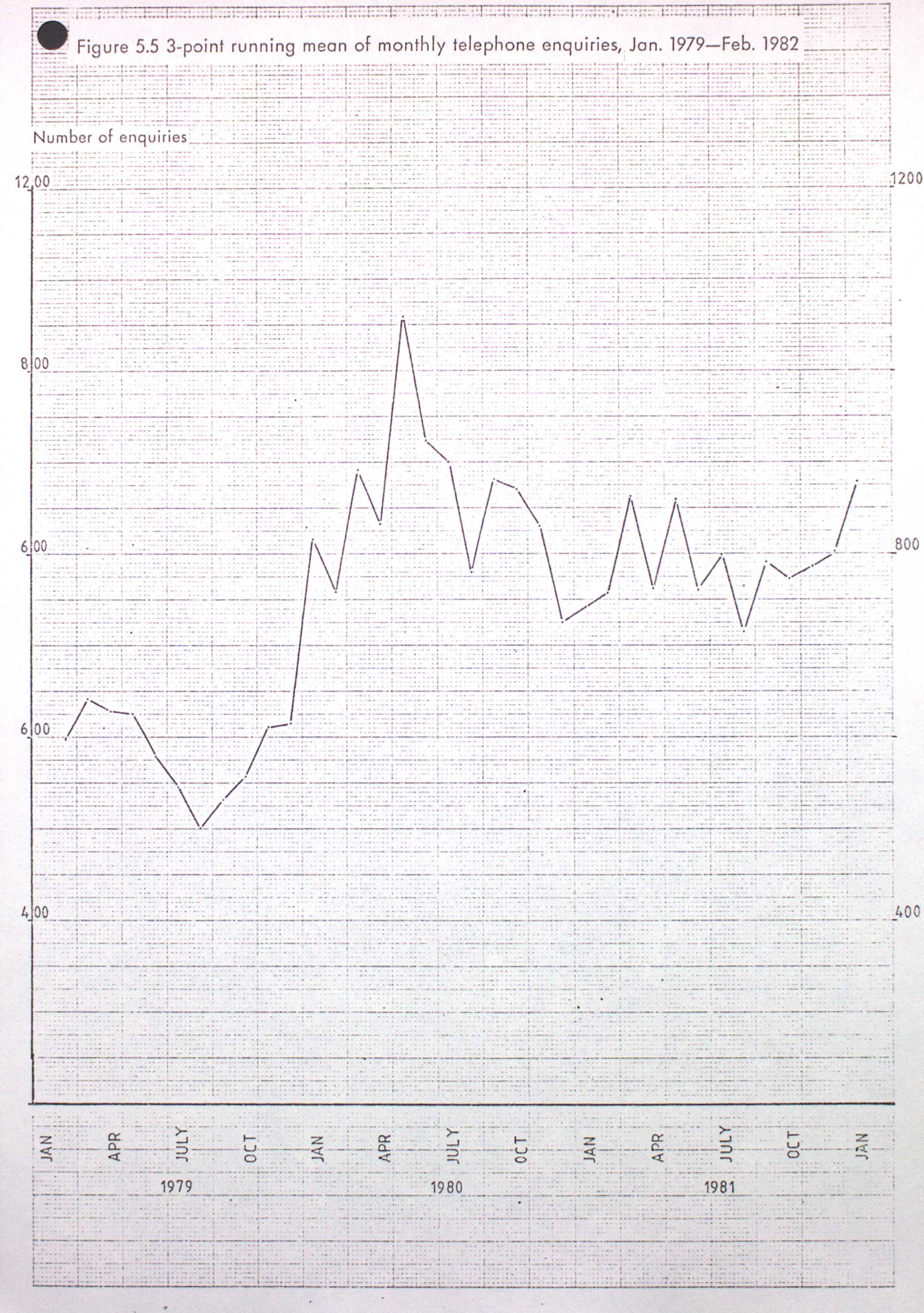


Figure 5.6 Time from receipt of enquiry to dispatch of the reply

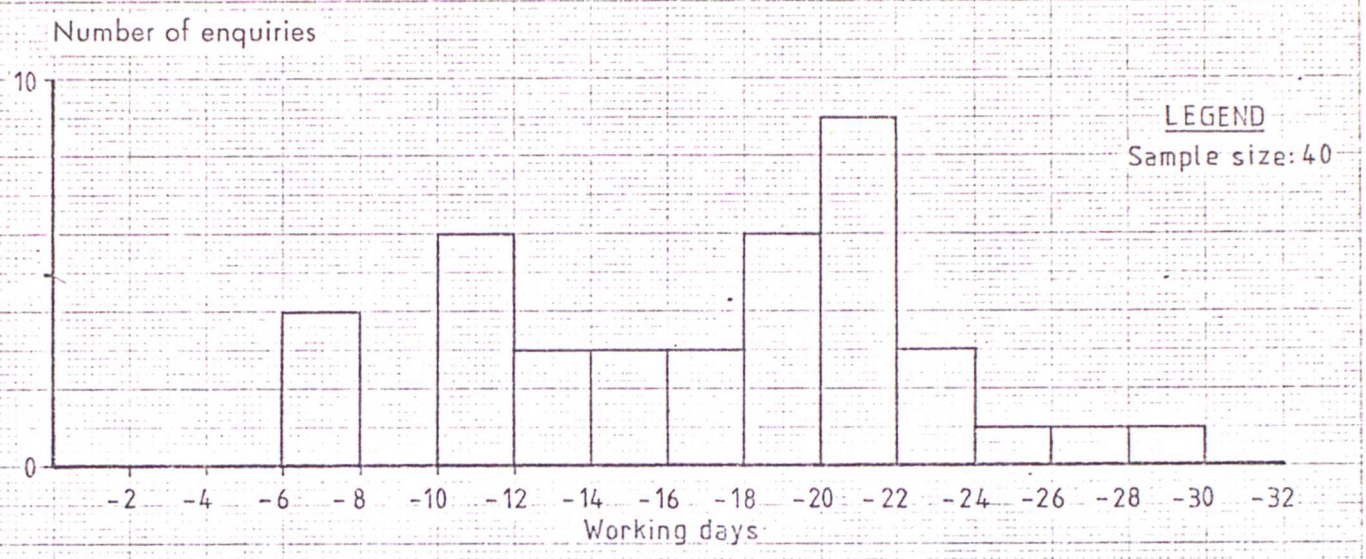
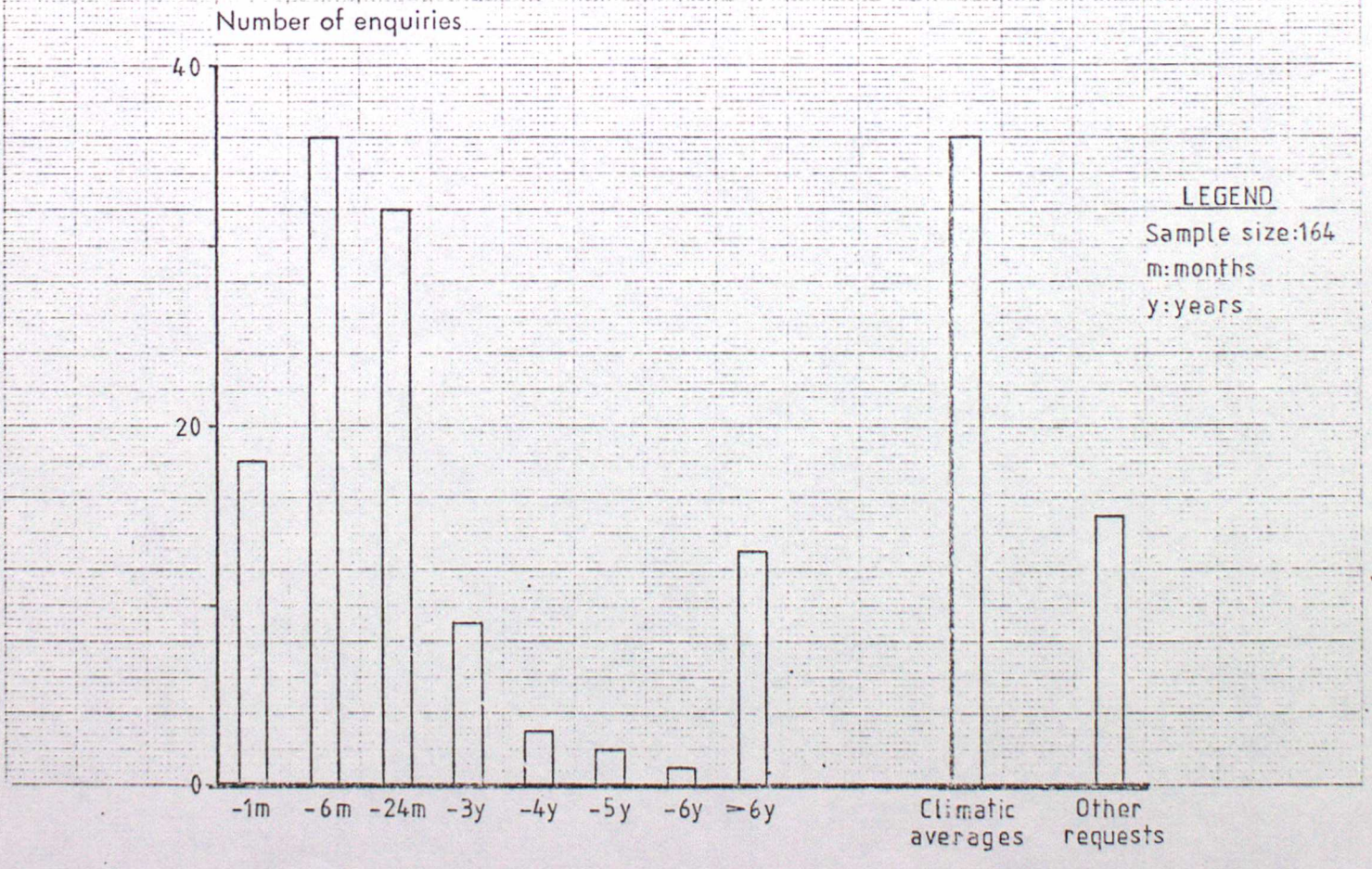


Figure 5.7 The information and age of the data requested



CUSTOMER CONTACT AND PRODUCT IMAGE

The 'image' in the public's mind of a company and it's product is very important in a commercial environment as it can lead to success or bankruptcy. Examples of image-building are easily found. Oil companies in recent years have attached importance to a good 'corporate image'; now the oil companies are advertised as environmentally conscious and battling against the odds in the interests of mankind rather than selling petrol for faster travel.

Some Public Service companies have also undertaken image-building. British Airways emphasise their care of passengers. The Post Office has devised a cartoon bird ('Buzby') to extol the use of the telephone. The Met Office however has not contracted consultants to provide a 'corporate image'. At such a level it is probably best avoided for a scientific establishment. However, the services side of the Office should give, in any public contact, the impression of an efficiently run and modern organisation as befits it's standing in the scientific community.

This impression should be conveyed in the correspondence of the enquiry bureau. Improvements in presentation of the written correspondence and other public contact will now be examined.

1. The letter of reply

The letter and associated papers (tables, invoices, etc) sent in reply constitute the final product to the customer. This paperwork forms the hard evidence on which the customer will decide if money has been well spent. The perception of the services of the office will often be founded on the basis of this reply. It is important that every effort should be made to create a good impression, which may later lead to further custom. Certain methods of improving the written correspondence to give such an impression are now considered.

1.1 Letterheading

Visual impressions are important and this should apply to paperwork. The design of letterheads, the layout of tables and text must form a pleasing product to the eye. The present headed notepaper, Fig 6.1, has a functional layout but a stern appearance. The information for further contact is given but that the reply is from the 'Climatological Services' branch is not mentioned in print.

Also any reply is requested to be addressed to the 'Director-General'. This seems anachronic; one would not order domestic oil and send the request to 'The Chairman of the Board,...'.

Met Office Edinburgh (a section of Met O 3) have made attempts to improve letterheads. This has been done with printed leaflets (discussed later) rather than writing paper but the main points of note apply to both.

A4 size paper has been used and boldly across the top of the sheet has been placed the heading 'Climatological Services - Scotland'. to the right of the Met. Office weather vane and cockerel symbol. In fig 6.2 this has been done with blue lettering on the overall white of the sheet and in Fig 6.3 white lettering on a blue background strip across the top of the page.

The heading boldly stands out, leaving no doubt who the correspondence is from and the likely subject matter. Examples of leaflets printed on this paper have been placed in Appendix 3.

1.2 Handwritten Letters

A problem that arose in the severe winter of 1981/82 was the large numbers of enquiries received, which caused a 3 to 4 week backlog in replying. This coincided with a depletion in the numbers of typists employed in the typing pool. Due to the latter problem, delays of several days (reaching 10 or more days at one point) were occurring in the sending and return of material from the typing pool.

So as to hasten replies it became easier in some circumstances to send a hand-written reply. It can not be said that any of the handwriting was illegible, but a high standard of calligraphy is needed to improve upon the appearance of typewritten text.

Some tabulated data (eg,wind frequencies) has been hand-copied from computer output to A4 paper, as this condenses the data. Photocopies of the hand-written tables are sent when appropriate. Though legible, these tables do not have the bearing of type face.

Typewritten text is the accepted standard in business letters and except in the most unusual circumstances should be used in all outside correspondence from 3b.

1.3 Standard letters

'Standard letters' are prepared texts fulfilling a need where that need frequently occurs. They take many forms, from unsolicited literature to the home to standard invoice forms. In both cases, the important point is the high frequency that the text is used.

If there is an area of correspondence in 3b where a tailored reply is not always necessary and the layout of the reply frequently occurs, then a standard text should be strongly considered.

More than half of 3b's correspondence is with the legal profession, who usually require a brief statement of weather at a particular time and place. In such cases a covering letter of a prepared text may be adequate. Another possible use of standard covering letters may be in replies where little or no income is gained e.g, educational requests.

The main benefit to 3b is that time would be saved from preparing and typing of individual texts.

2. Further points on presentation of written correspondence

A reply usually consists of a letter, some form of listed or tabulated data and an invoice, the latter being a standard form. Improvements in the letter have been given in part 1 of this chapter. Ways of improving the overall presentation of correspondence are now looked at.

2.1 Covers

The sheets of paper of a reply are placed loose in an envelope and then posted. Ths issue here is that the customer is paying for this information and the manner in which the goods are received will affect whether the customer feels the purchase was value-for-money. At the moment, £15 to £20 is a common charge for what may be (mistakenly) viewed as 'a few sheets of paper'.

There is a strong need to improve the packaging of the 3b product. This can be done simply and inexpensively. Examples have been obtained from Met. Office Edinburgh of two possible methods, these being flimsy card covers of a wraparound

nature or cover boards held together by a plastic sliding spine. The examples are presented as a separate section in Appendix 4.

In the three examples of wraproud card covers obtained, each has a simple design on with a title of eitner: 'Headquarters Bracknell', 'Weather Centre Services' or 'Weather Centre Services for Yachtsmen'. The latter has an eye-catching yacht illustration.

The design of the card covers and spine has the supplier's name (Met O Edinburgh) and address boldly displayed. A small title indicating the contents has been centrally placed.

Similar ideas for covers can be envisaged for 3b work. A legal profession cover could be prepared with a logo of say, 'Meteorological Office - Legal Enquiries Service'. Folders for the building trade or for wind enquiries could be prepared, the latter with an illustration of 'The Tower of the Winds' perhaps?

Discussion with Met O 18 has indicated that these wraproud card covers cost a few pence each. The loose covers with plastic spine can be expected to cost little more. Both serve to improve the authority and prestige of the articles within, which is the important result wanted.

Alternative coverings should also be considered. Each month within 'Office Equipment Index' (a trade magazine taken in the Met. Office Library) are advertisements for means of document covering. Usually small desk-top machines are involved. Some of these advertisements are shown in Appendix 6.

Where there are several pages to a reply a ring-binder covering may be appropriate. Other methods involve adhesive or thermal binding. Some also allow 'window cut-outs' in the front cover, accentuating the document title. Further information should be sought on all these methods, especially with regard to pricing.

2.2 Background information: simple statistics and site description

The requests for data from 3b vary greatly in character. Many, however, are for relatively simple statements of weather on a particular day or a frequency table. In these circumstances, it is usual to give the basic information to fulfill the request. Often, further background information or a brief description based on meteorological experience is not given. If it were, then the customer would be better able to comprehend the information and make decisions on the basis of it.

Simple statistics such as minimum, maximum, mean, expected frequency, etc should be included in this effort. For example, in answer to a request, the midday temperature may have been -1.0°C at Heathrow Airport on a December day. That information alone allows little interpretation. The mean midday temperature at Heathrow in December should also be given. Also the expected return frequency of -1.0°C at that time of year or the minimum temperature expected to be passed, say, at a probability of 1 in 10 and 1 in 25 Decembers. This helps to put into perspective how extreme the observed temperature was.

The provision of descriptive statistics would make a strong contribution to the impression of expert consideration having gone into the reply, rather than only data extraction. Though it may not be important to the customer in all cases the impression of efficiency will be given and in many cases a better understanding will be gained.

In addition to these statistics, information on the method of recording and the observation site will help to convey how and where the data was recorded. Such information need only be brief, consisting of two or three sentences which note altitude, a grid reference, whether Met. Office or cooperating observer

and any pertinent detail to that station, eg, roof top instruments at L.W.C. Such information may have to be circumspect for R.A.F. sites.

The necessary information is available from 'Site Inspector's' reports held in Met O 3 and from Met O's 6 and 7.

2.3 Illustration

It is generally agreed that greater impact is made with graphical portrayal of data than listed data. However, in present 3b correspondence little use is being made of visual methods to convey information. One exception is the occasional use of the L.W.C. Daily Weather Summary for synoptic charts, which are photocopied and enclosed in the reply. A degree of familiarity with synoptic charts from BBC weather forecasts is a reasonable, though challengeable, assumption.

Greater use of this source of information both in frequency and amount extracted could be made to enhance replies with meteorological content, both diagrammatic and text. The summary of UK weather for the day on this document along with one or more synoptic charts as appropriate could be enclosed. The use of lay weather terms on these charts is further cause to use this source more often. An example of one day's Daily Weather Summary is given in Figs 6.4 and 6.5 (each side of one document).

Statistical diagrams should also be employed as a means of placing basic information in a wider context. These should be simple diagrams in the main, such as variable-time graphs with possibly an average line drawn. To use December temperatures as an example then the last 30 or 40 years data could be used for say, the average minimum December temperature in each of those years. Other possible diagrams are rainfall histograms or maps with isopleths of sunshine hours, frequency of thunderstorms, etc.

Wind roses are a meteorological diagram and occasionally they are mentioned in requests for frequency tables. The reaction to a request for such tables should include the automatic supply of at least one wind rose applicable to that station. These diagrams need not necessarily be based on the period of data requested for, as long as the rose forms a representative diagram of the wind regime. With this proviso, wind roses can be prepared and held in advance.

Computer programme subroutines are in fact available in Met O 3 to produce wind roses from frequency data; the subroutine at present lacks a degree of flexibility but there is no reason why this should not be achieved. The wind rose is drawn on film and hard copy can be obtained from this when needed. An example is included in part 2.5 of this chapter (Fig 6.19).

(This would seem to be an example of poor exchange of information within the Office, here within a branch. The wind rose routine is associated with the Data Sort Programme ('DSP') of Met O 9, and on this work there has been good cooperation between two branches. Unfortunately, the information on computer-drawn wind roses has not filtered into enquiry work).

2.4 Literature: Met Office publications and reference lists

A book frequently referred to by Met O 3b, is 'The English Climate' by H H Lamb. This reference is given in answer to 'where to live' enquiries from people with health problems, which may be alleviated by moving to a more amenable climate. Two chapters in the book are applicable to the problem. This is a good use of outside references where they are appropriate to the enquiry. In this instance though if some data summary could also be given, in the summary form perhaps of the brochure 'Your Holiday Weather' (produced

by Met O 7) or 'The Scottish Climate' (3b). Copies are in Appendix 3.

The above example is a case where a reference answers a specific enquiry. However, greater use of reference lists should be made, where it is thought the enquirer may wish to delve further into the meteorological problem to obtain a clearer understanding of information provided. Two reference lists do exist, one for data sources and the other for meteorological texts. These are shown in Figs 6.6 and 6.7. Both however are aimed at students and more appropriate lists for professional people are needed.

Furthermore, both of these lists could be improved in layout and content and be brought up-to-date eg. the Daily Weather Report reference. A better description of items would improve impact, in particular of Met. Office products e.g. Climatological Memoranda should be briefly described.

Reference lists serve to promote interest in the use and understanding of information provided. Taking a more commercial standpoint, literature should be selectively enclosed in replies to promote Met. Office services. The purpose is to promote future enquiries from customers who have already shown an interest by developing knowledge of other services that may be of use.

Available literature about services range from a broadsheet ('Save Energy Costs') to brochures of 10 or so pages ('Professional Training Courses'). The variety is shown by the selection included in Appendix 3.

Certain leaflets should be sent to specific enquirers. Builders invoking extension of contract clauses could be given 'Weather Services to Builders', to illustrate other possible use of Climatological and Meteorological information. 'Save Energy Costs' should be of great interest to industrial concerns. The cost of these leaflets is small compared to average charges, the ratio being of the order of 1:100. This small cost can be borne in the bill. Once the practice of sending services literature has gained ground then broadsheets can be produced as the need becomes apparent.

Services of other branches should be promoted in 3b correspondence. Met O 7 for example, have a set of satellite photographs for sale which can be considered of general interest and especially educational interest. Their existance should be promoted along with such items as the Met. Office calendar. Similarly the Met Office Prestel service; the general index page number should be listed on notepaper as automatically as telephone numbers. Even if the enquirer is not a Prestel owner, spreading word of the system is of benefit to the Office in the long-term.

When subliminal advertising of this nature, emphasising the benefits to be obtained, is placed before a prospective customer, custom is more likely to be generated than when only passing reference is made to a title of a services leaflet.

2.5 'G Eve & Co' - A possible reply

In section 1.3 it was suggested that 'Standard Letters' should be examined. They may prove useful where the reply is often of the same form and time would be saved in replying. In this section an enquiry which needed a tailored reply is studied.

This enquiry was received in April 1981 from G Eve and Co. of London, a company of Chartered Surveyors. This letter is reproduced in fig 6.8. The reply consisted of the letter in fig 6.9, frequency tables (figs 6.10 to 6.13) and an invoice.

This enquiry has been taken as an example to show an alternative style of reply, both in the text of the letter and in the supply of diagrams. It was chosen as in the last paragraph of the original letter a consultancy service request is implied; unfortunately it was not taken up by the customer (fig 6.14).

In figure 6.15 is the text of the suggested letter. In the first paragraph the 'pleasure' of dealing with the customer is expressed followed by a statement stating what was asked for has been given. In further paragraphs, the idea is outlined that this is not enough information for the purpose expressed. Further work that can be done by the Office and the benefits to the customer are explained. Only at the tail of the letter is a fee mentioned. No actual figure is listed; the aim is to establish further contact from which the advantages to the customer can be emphasised, at which point a fee is more likely to be accepted. This is not a confidence trick; a product is more likely to be bought when it's usefulness is known.

The percentage frequencies of wind velocity for 1970-1980 are presented in fig 6.16, in the form of tabulated computer output. Similar monthly output is available.

The 'Wind Velocity Rectangle' referred to in the letter as computer plots is presented in fig 6.17. This figure has been drawn by hand in Met O 18, but it is foreseen that such a diagram can be drawn by existing computer facilities. That the diagrams and tables are from a computer is mentioned to hopefully convey that machine effort has not been spared in handling the enquiry.

A wind rose has been produced and is shown in fig 6.18. This is the usual method of displaying wind frequency data. The rectangle has been drawn after Zambakas (1982). Though professional meteorologists may find a wind rose familiar a 'wind rectangle' may be more easily understood by other members of the public. Both are presented here for discussion.

To conclude, the original letter in reply follows a nearly standard format. There is nothing wrong with that style but it is suggested that the alternative reply takes a stronger stance to entice further work. The graphical work is presented to show the greater impact obtained when such material is enclosed. The material should be regarded as having been sent in covers as described in section 2.1.

3. Points of contact other than letters

3.1 Acknowledgements

Sending acknowledgements is no longer part of the methods of handling enquiries (see Chapter 2). This practice stopped, apparently because of the time and expense involved in completion of acknowledgements. A system at it's most efficient would produce no need for acknowledgements as the reply would be sent sufficiently quickly, so that the customer would not have time to become concerned about the enquiry.

Delays will still occur in climate enquiries, however capable the 3b methods are to turn round an enquiry quickly, because of the methods of quality control and collection of data. This is particularly so in the case of cooperating observers who send in their data once-a-month. For example if a customer sends in a request on 2nd February for weather information on 1st February then the data will not be available until mid-March, if it is necessary to use a climatological station.

In such circumstances, an acknowledgement should be sent to notify of the delay, giving a brief explanation. This may be in the form of a tick-list.

An acknowledgement is an act of politeness, which indicates concern for each enquiry.

At present, because of the backlog of enquiries, 'phone calls are being received from customers chasing the progress of the enquiry. At least some of this frustration would be removed if acknowledgements were sent, particularly in the case of data-collection delays.

3.2 Telephone calls

In recent years, there have been approximately 10,000 'phone calls to the Bureau each year. This implies that each person answers approximately 2,000 calls each year. Telephone answering is therefore most important, yet no training is given in this area to Office staff who are in frequent public contact. Short-temper, shouting or whispering voices, an attitude of 'too busy at the moment' could badly affect relations with the public.

These problems do not exist at the moment. However, the lack of training for 'phone use and other public contact should be noted and taken up for correction.

A problem that does exist is 'phones left ringing because people have left work or, where all phones are in use, the customer doesn't get through. This is far from uncommon and could be corrected by use of an answering machine. The message at the minimum could ask people to ring again: Their frustration at a ringing phone would be curtailed and later conversation likely to be made in a better frame of mind. As with acknowledgements, a telephone answering machine is both polite and indicative of business efficiency.

Outgoing calls are fewer in number than incoming. Their usual purpose is to clarify points raised in letters. Staff time is wasted frequently by waiting for the telephone to be answered and then following that waiting for the right person to come to the 'phone. A device frequently used in travel agents, which can be switched on or off at will, amplifies any incoming sound. Thus, a person can continue work and hear the ringing tone or people answering the 'phone, at which point a normal conversation is resumed. Installation of such a machine (a small unit) should be considered.

3.3 Customer visits to the Met. Office

When people come to visit, any discussion is currently held at the employee's desk. The customer will not have room to place his own papers on a table. Space will often not be available to properly layout diagrams, tables, etc. In most rooms of the enquiry section, attention will also be fought for with other people's work and also telephone calls.

Presentation facilities are very poor. As a start, a table and a few chairs could be set aside in a room and display boards placed nearby. An array of leaflets should be available. Further developments may include an overhead or slide projector.

An ideal solution would be a separate 'presentation room', but space is tight in Met O 3. Met O 7 have such a room set aside, Room 208 (to which some improvements could be made!). Arrangements should be made for this to be regarded as a presentation room commonly available to all. It is incongruous that customers of one branch will receive better treatment and presentation than customers to another branch. These developments will be essential if greater importance were to be attached to consultancy work.

3.4 Prestel

Prestel is the Post Office 'Viewdata' system, this being a relatively recent development in communications whereby a domestic television set is used to display information. Prestel uses telephone lines to send information from a computer to the user's television. In this way, it differs from 'Teletext' (information services provided by the BBC and ITV) which uses spare capacity in the broadcast television signal to transmit information.

This fundamental difference has important consequences. The amount of information available on Prestel is much greater than on Teletext. The control of information displayed on Teletext rests with the broadcasters, but with 'Information Providers' on Prestel. Ths Information Provides ('IP') enter into contract with British Telecom to use a certain number of frames, a frame being a 'page' of displayed information. Most importantly, an IP can charge for every access made to information provided on Prestel.

The Meteorological Office has become an IP, because Prestel is regarded as a useful way of disseminating meteorological information with the attribute of earning revenue. Eight hundred frames are currently used for a variety of purposes as listed in Appendix 5. The information provided is under the management of Met O 7.

The position of Met O 3 and Prestel has been examined from three viewpoints. Each is now discussed

a) The use of Prestel as 'electronic mail'.

It is possible to have a 1:1 correspondence on Prestel between IP and customer. The economics of this however, may be limited by the maximum frame charge being 50p per frame, though the software exists to handle a £10 per frame charge.

When a group of users all want the same information at a set regular interval then Prestel is of use in disseminating the information. This is especially so when the information is suited to the Prestel format. This has been tried with Met O 8's MORECS evapotranspiration data service. This was technically successful but proved impractical as not enough MORECS recipients had access to Prestel.

Thus Prestel for use as 'electronic mail' is an area which needs to be borne in mind for future developments, especially for routine 3b data. An entry terminal for combined Met O 3 and 8 use may prove cost-effective when more Prestel sets are in use.

b) Prestel as an advertising medium for Met. Office services.

Several pages are currently (April 1982) used to list services. The principle of advertising services on Prestel is commendable but the effectiveness of the method may be questioned especially as these pages are not revenue earning to a Prestel account. Some measure of how efficient advertising on Prestel is, could be found by interrogation of each Prestel computer to find the number of times a frame is requested. A complete survey has not as yet been done as it is a relatively costly and time-consuming process.

A major drawback is the small amount of text that can be placed in a frame, this being a maximum of 40 characters on 22 lines. Thus participation by 3b in advertising may be limited to a few pertinent figures updated occasionally followed by an address for further information.

c) Prestel climatic information of general interest.

A description of average UK weather conditions is provided by season and by month. This information occupies a total of 46 pages, each having a viewing charge of 4 pence. Of these 46 pages, 2 per month (three for July) cover noteworthy weather events in the past years.

Met O 3 could provide information that would improve the presentation of these latter frames without major decisions or developments taking place. For example, the information could be updated more frequently and climatic information doretailed to events in the past few days.

There is a very strong need for recent events, including even the previous day to be noted on Prestel to meet a short-term interest in that event. Such interest does exist as testified by telephone calls received in 3b. For example, heavy snowfalls in December 1981 lead to enquiries on 'The Last White Christmas in London'. That information could have been provided with a brief note about the early December snow on Prestel. Furthermore in summer heavy convective rainfall could be compared to record UK and World falls, in the style of 'The Guiness book of records'. The latter is a noted best-seller.

In conclusion, Prestel is an innovative communications medium. It has the advantage to the Met. Office of allowing revenue to be gained from display of its information. However a major drawback is the small amount of information available per frame. It is therefore a medium most suitable to short, terse statements. Met O 3 can most usefully provide information to put recent weather into a longer-term perspective. Advertising services is already being done, though this needs to be examined to see if presentation can be improved. At present there doesn't seem to be an opening for using Prestel as a form of 'electronic mail', though this should be kept under review. Once Prestel has becmme more firmly established in number of sets in use the possibility of establishing 'Closed User Groups' should be examined.

4. Conclusion

Attention has been focused on the need to improve the image of the Enquiry Service, through better packaging of replies and by greater attention to detail in serving customers needs.

Several ideas have been put forward to achieve this aim; the implementation of each requires varying degrees of effort but none are large projects. Some improvements needing little preparation include ensuring all replies are typed rather than handwritten, introducing a bold letterhead for enquiry services; placing loose papers in covers; sending existing services broadsheets with appropriate replies; the re-introduction of acknowledgements where necessary.

Some ways of achieving improved presentation that have been discussed require a greater degree of effort. This may include financial agreement, programming effort and policy decision. Such problems will be encountered in implementing methods of illustration, literature preparation, the supply of statistics and the installation of a telephone answering machine. For customer visits the need for a 'Presentation Area' has been noted.

The impact of Prestel has been examined and suggestions for greater cooperation in the use of this information medium put forward.

Each suggestion by itself will have, at most, a moderate effect but overall the implementation of these suggestions will be a strong move towards a more responsible and commercial attitude to Enquiry Services.

METEOROLOGICAL OFFICE
London Road Bracknell Berkshire RG12 2SZ

Telex 848160 847010 Telephone 0344 (Bracknell) 20242 ext

Please reply to The Director-General
Your reference

Our reference

Date

Fig 6.1. Headed notepaper presently used for enquiry replies

CLIMATOLOGICAL
SERVICES -
SCOTLAND

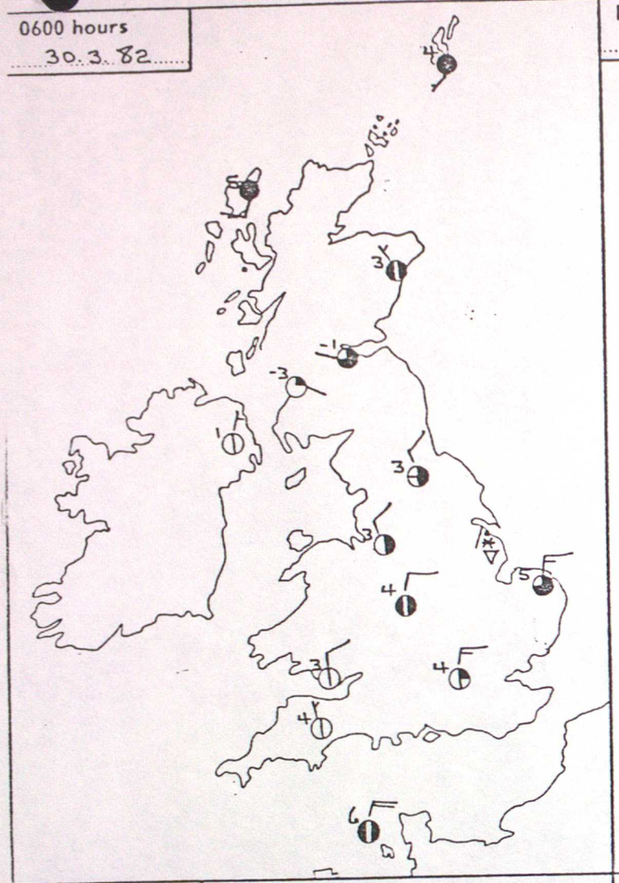
Fig 6.2. Headed paper used by Met Office Edinburgh for leaflet production.

CLIMATOLOGICAL
SERVICES
SCOTLAND

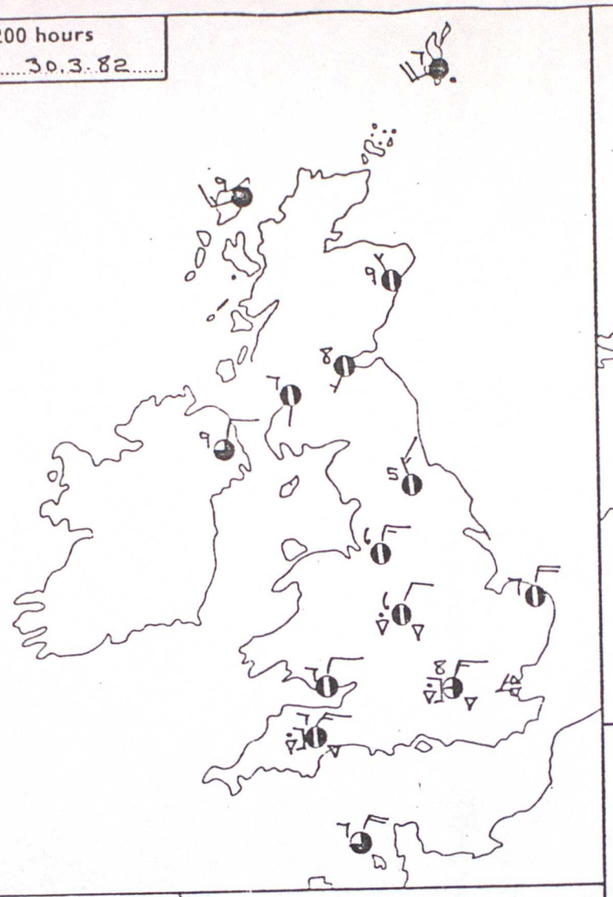
Fig 6.3. Headed paper used by Met Office Edinburgh for leaflet production.

Fig 6.4. One side of London Weather Centre.
Daily Weather Summary : British Charts.

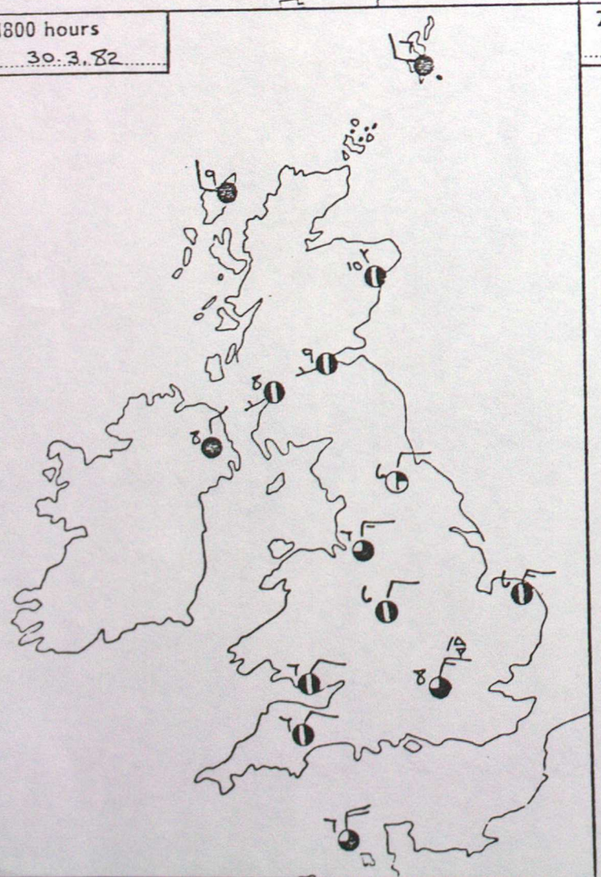
0600 hours
30.3.82



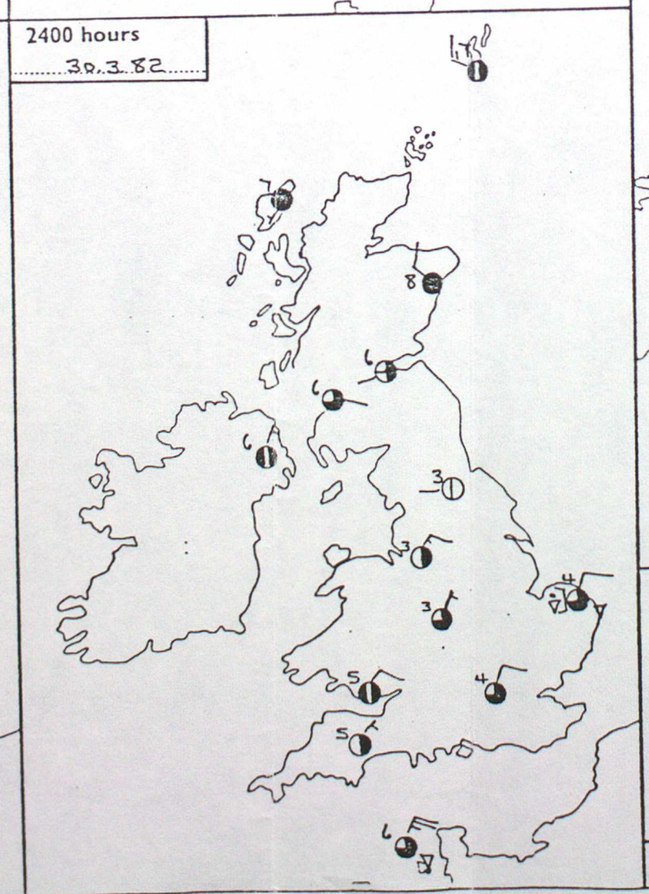
1200 hours
30.3.82



1800 hours
30.3.82

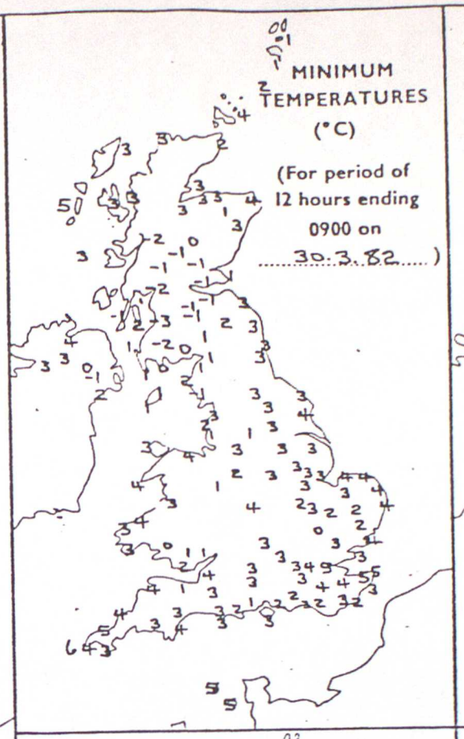


2400 hours
30.3.82



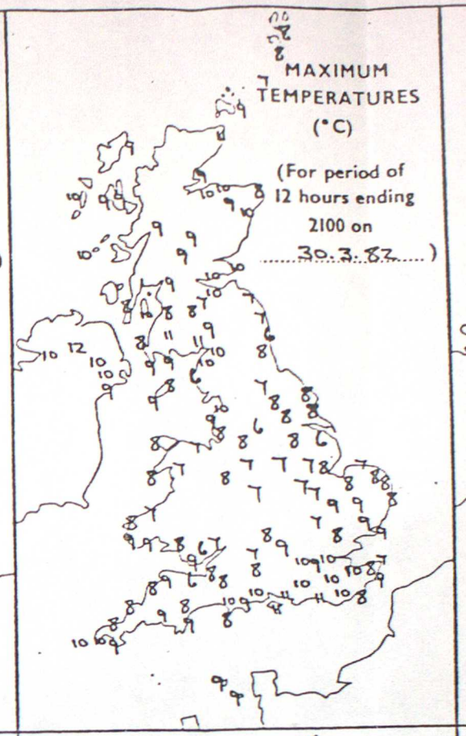
MINIMUM TEMPERATURES (°C)

(For period of 12 hours ending 0900 on 30.3.82)



MAXIMUM TEMPERATURES (°C)

(For period of 12 hours ending 2100 on 30.3.82)



SUNSHINE (h)

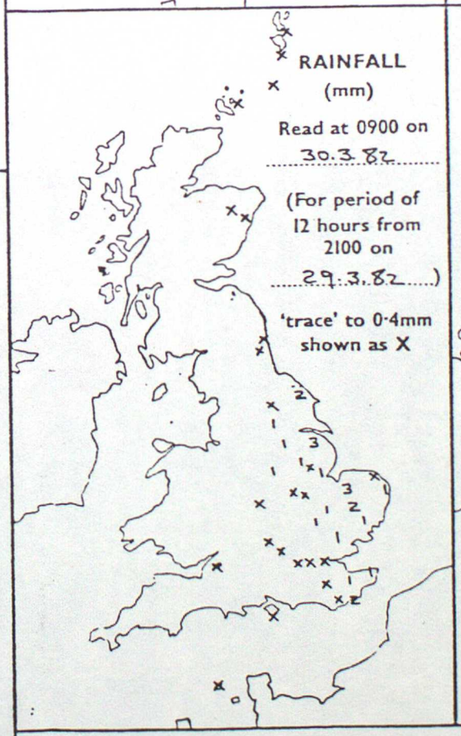
Dawn to dusk 30.3.82
0·1 to 0·4h shown as X

RAINFALL (mm)

Read at 0900 on 30.3.82

(For period of 12 hours from 2100 on 29.3.82)

'trace' to 0·4mm shown as X

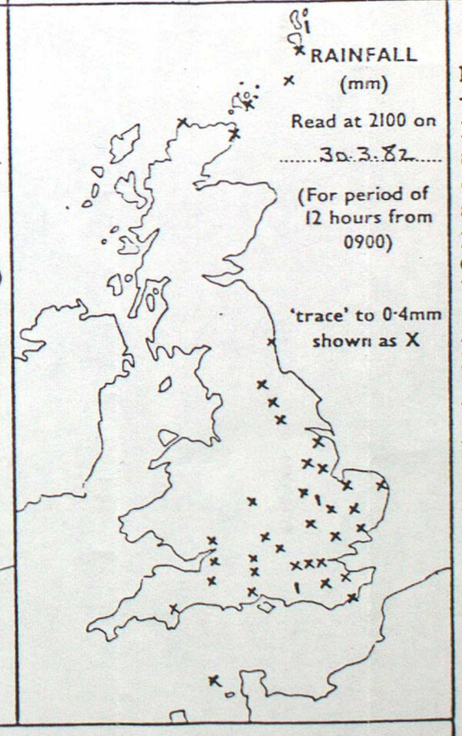


RAINFALL (mm)

Read at 2100 on 30.3.82

(For period of 12 hours from 0900)

'trace' to 0·4mm shown as X



'Extremes' for TUESDAY 30TH MARCH 1982

Highest maximum	: 12.2°C Carrigans (Co. Tyrone)
Lowest minimum	: -3.3°C Prestwick (Nr. Ayr)
Lowest grass minimum	: -8.7°C Glasgow Airport
Most rain (24 hours from 0900 h)	: 1.1mm Wittering (Nr Peterborough)
Most sun	: 10.5hrs Colwyn Bay (North Wales)

SUMMARY OF BRITISH WEATHER

Most eastern areas of England, the Midlands, East Anglia, London, central southern and southeast England were rather cloudy and there were quite a few showers about in these parts overnight. During the day, however, the showers became well scattered with sunny intervals in most places and by evening showers were mainly confined to East Anglia. Some southern and southeastern coastal areas however were mainly sunny. The cold fresh to strong north northeasterly winds reached near gale force at times along some southeastern coasts. Wales, western areas of England and the Channel Islands were mainly dry with sunny intervals and western coastal areas were mainly sunny. There were some sunny intervals at first in Northern Ireland and southwest Scotland otherwise Northern Ireland and Scotland were mostly cloudy but dry, apart from a little rain or drizzle here and there in northern Scotland.

London Weather Centre 284 High Holborn London WC1V 7HX

All times are GMT

© Crown Copyright

Fig 6.5. One side of London Weather Centre Daily Weather Summary: Atlantic and European Synoptic Charts.

DAILY WEATHER SUMMARY

FOR TUESDAY 30TH MARCH 1982

Warm front Cold front Occlusion

All times are GMT

London Weather Centre 284 High Holborn London WCIV 7HX

© Crown copyright

0600 hours 30·3·82

1200 hours 30·3·82

1800 hours 30·3·82

2400 hours 30·3·82

SOURCES OF CLIMATOLOGICAL DATA FOR THE UNITED KINGDOM
FOR STUDENTS WRITING ESSAYS OR THESES

Books of Averages

Averages of Temperature for the United Kingdom, 1941-70, (Met O 883). In degrees Celsius.

Averages of Bright Sunshine for the United Kingdom, 1941-70 (Met O 884).

Averages of Rainfall for Great Britain and Northern Ireland 1916-1950, (Met O 635).

Averages of Earth Temperatures at Depths of 30 cm and 112 cm for the United Kingdom 1931-1960 (Met O 794).

Averages of Humidity for the British Isles (Met O 421).

Tables of Surface Wind Speed and Direction over the United Kingdom (Met O 792)

Tables of Temperature, Relative Humidity, Precipitation and Sunshine for the World, Part III - Europe and the Azores (Met O 856c). Contains data for a few places in the United Kingdom in a form not found in the above publications.

The Monthly Weather Report, published six or seven months after the end of the month to which it refers, contains summaries, frequencies and extremes for the month for the various climatological elements in respect of several hundred places throughout the country. For places which have appeared in the Report for some time, long-period monthly averages and frequencies can be worked out be adding and meaning the data for a number of years: this is a way of obtaining averages for places not in the books of averages, and for elements, eg days of frost or snow, for which there are no published averages. The Monthly Weather Report also includes a general description of the weather of the month, and maps of the main climatological elements.

The Annual Summary of the Monthly Weather Report contains data and information for the year as a whole, largely similar to that of the Monthly Reports, but with some additional tables. It includes brief descriptions of the weather of each month.

The Daily Weather Report contains tables of meteorological observations in code form for about 55 stations, and also weather maps for each of the hours midnight, 0600, 1200 and 1800 GMT. It is a convenient source for details of the weather on particular days. The Monthly Summary of the Daily Weather Report is a single sheet with monthly summaries of temperature, sunshine, rainfall, days of thunder, snow and fog for 20 places. It also has a brief general description of the weather of the month. These reports are available from the Secretary, Meteorological Office (DWR Despatch), London Road, Bracknell, Berks.

British Rainfall is an annual publication of over 100 pages which describes in some detail the rainfall of the year by means of tables (some on a monthly basis), maps and articles. The General Table of the volume gives long-period annual averages for a large number of places.

Fig 6.6(a). Front of leaflet on data sources.

The Climatological Atlas of the British Isles (M O 488) contains maps of all the main climatological elements. Each section has an introduction with descriptive information, tables and diagrams to supplement the maps, and also a bibliography. The Atlas is no longer being printed, but may possibly be seen at reference libraries. More recent data in map form has been published in the Climatological Memoranda series (see below).

London Weather by J H Brazell (Met O 783) contains a continuous sequence of records from the middle of last century.

Hydrological Memoranda - which include long period averages of monthly and annual rainfall, average daily rainfall amounts and frequencies, details of maximum and minimum monthly rainfall and of heavy falls in short periods, and maps of average annual and monthly rainfall (as percentage of the annual) - are available from this Office (Branch Met O 8c) at a cost £2.00 each, for the catchment areas of the various River Authorities. Requests for the memoranda should state what river catchment or area should be covered, so that the appropriate memorandum can be supplied.

Climatological Memoranda. The climate of certain areas with comprehensive tables are available from this office (Branch Met O 3b). Some tables of monthly and annual average temperature and sunshine additional to those listed above, and also maps of various elements are available in this series. The cost ranges from about 75p to £2.

A chapter on the climate of most counties is included in the publication of the Land Utilisation Survey of Britain, London School of Economics, Houghton Street, WC2.

A simplified map of the average rainfall for the period 1916-1950 for Great Britain and Northern Ireland, on a scale of about 32 miles to 1 inch, in black and white, can be obtained, price 15p each, from this Office (Met O 8c).

Note. All the above publications can be obtained (unless otherwise stated) from HM Stationery Offices.

Facilities at the Meteorological Office. Climatological data and books of reference in the State Meteorological Library at Bracknell can be consulted by members of the public during normal office hours, normally without charge, but a search fee is charged if an appreciable amount of staff time is taken up attending to the requirements of a visitor.

Records for Scottish stations are held in Edinburgh, and may be consulted on application to the Superintendent, Meteorological Office, 231 Corstorphine Road, Edinburgh, EH12 7EB. Similarly for Northern Irish data application should be made to the Senior Meteorological Officer, Tyrone House, Ormeau Avenue, Belfast, BT2 8HH.

Weather Centres A limited amount of data and books of reference can be consulted at the Meteorological Office Weather Centres at the following addresses: Penderel House, 284/286 High Holborn, LondonWC1V 7HX; 160 High Street, Southampton SO1 0ET; 56 Royal Exchange, Manchester M2 7DA; 118 Waterloo Street, Glasgow G2 7DN; 7th Floor, Newgate House, Newgate Street, Newcastle upon Tyne NE1 5UQ.

Meteorological Office (Met O 3b)
London Road
Bracknell
Berkshire RG12 2SZ

Fig 6.6(b). Reverse side of leaflet on data sources.

A SELECTION OF BOOKS ON METEOROLOGY

Please note that we cannot guarantee that all books listed here are currently in print.

I. Meteorological Office publications obtainable through Her Majesty's Stationary Office (HMSO)

A course in elementary meteorology	D E Pedgley	(Ref)	Met O 911
The practice of weather forecasting	P G Wickham		Met O 817
Handbook of aviation meteorology			Met O 818
Meteorology for mariners			Met O 895
Observer's handbook			Met O 805
Marine observer's handbook			Met O 887
Cloud types for observers			Met O 716
Guide to plotting procedures			Met O 877
The meteorological glossary			Met O 842
Hygrometric tables Part I. Stevenson Screen, deg. F			Met O 265a
Part 2 " " " C			Met O 265b
Part 3 Aspirated psychrometer, deg C			Met O 265c

Climatological data:

Averages of temperature, UK, 1941-1970 (Degrees C)	Met O 883
" " bright sunshine, UK, 1941-1970	Met O 884
Tables of temperature, relative humidity, precipitation and sunshine for the world:	
Part 3. Europe and the Azores	Met O 856c
Tables of temperature, relative humidity and precipitation for the world:	
Part I. N America, Greenland and E Pacific	Met O 617a
Part 2. Central & S America, W Indies, Bermuda	Met O 617b
Part 4. Africa, Atlantic S of 35°N, Indian Ocean	Met O 617d
Part 5. Asia	Met O 617e
Part 6. Australasia, S Pacific and corresponding parts of Antarctica	Met O 617f
Tables of surface wind speed and direction, UK	Met O 792
[Averages of rainfall - see 2.]	

Periodical publications

Monthly Weather Report. A comprehensive record of climatological data and summaries for all UK Climatological Stations. Published several months in arrears; back numbers available from 1971. Reference changes annually.

The Meteorological Magazine. Published monthly. Contains scientific articles, reports, etc., of interest primarily to professional meteorologists and University and School staff.

Notes.

A more comprehensive list of publications available through HMSO will be found in HMSO Sectional List 37, with prices and addresses of Government Bookshops. Sectional List 37 includes Climatological and Scientific Notes and METFORMS (autographic records, observer's notebooks and forms for climatological returns).

Turn to Section 2 for Meteorological Office publications available direct from the Meteorological Office.

Fig 6.7(a). Meteorological textbook reference list (page 1).

2. Meteorological Office publications available direct from:
Meteorological Office
[Branch]
London Road
Bracknell
Berks RG12 2SZ

a. Climatological data:

Averages of rainfall for Great Britain and N Ireland, 1941-1970
Explanatory booklet and tables for selected Stations — Met O 886
Maps of average rainfall: (Scale 1:62500)
Southern Britain — Met O 886SB
Northern Britain — Met O 886NB
North of Ireland — Met O 886NI
[Branch - Met O 8b]

b. Climatological Memoranda for UK. Full list from [Branch] Met O 3b

c. Daily Weather Report, with Introduction (explanatory booklet). This comprises a sequence of surface weather charts for the 24-hour period from 1200 GMT, a selection of UK observations (in code) for 1200, 1800, 0000, 0600 GMT and twice-daily climatological returns.

d. Monthly summary of the Daily Weather Report.

e. Daily Aerological Record. A record of upper air soundings over the the UK (in code). An explanatory booklet is included.

f. Monthly Weather Survey and Prospects, comprising:

I Weather prospects for the coming calendar month.
II Survey of weather in the UK for the previous month.
III " " " " " N Hemisphere for the previous month.
IV Averages and noteworthy events from the past for the month covered by I (Weather Prospects). Averages for 35 UK stations are included.

On the 15th of each month a further issue, comprising items I, II and III, is published.

Items c to f: Full details and subscriptions from [Branch] Met O 18c/DWR. Reduced rates per term are offered to Schools.

g. General bibliographic information: [Branch] Met O 18 National Meteorological Library.

3. Meteorological Office Leaflets and Brochures, including Leaflet No 1 - Weather advice to the community; No 3 - Weather bulletins for Shipping; No 5 - Taking weather observations; No 6 - Rules for rainfall observers; "Sail weather wise"; brief notes on some aspects of the work of the Meteorological Office: [Branch] Met O 7a. (All these items are free).

4. Other periodical publications:
Weather. Published monthly by: The Royal Meteorological Society
James Glaisher House
Grenville Place
Bracknell
Berks
Articles and reports, suitable for both professional and amateur meteorologists.

Quarterly Journal of The Royal Meteorological Society. Address as above.
The premier meteorological journal in the UK, for professional meteorologists and scientists in related disciplines.

5. School projects on weather and weather observing:
Running a School Weather Station. D E Pedgley. Published by
The Royal Meteorological Society, address as above

Fig 6.7(b). Meteorological textbook reference list (page 2).

Textbooks

a) Primary School and younger Secondary School pupils.

The Ladybird book of the weather.	F E Newing & R Bowood	Willis & Hepworth Ltd
The Weather	B Bailey	Macdonald & Co Ltd
Fun with meteorology	J Scott	Kay & Ward
The weather guide	A G Forsdyke	Hamlyn
Weathercraft	L P Smith	Blandford Press
Weather Studies	L P Smith	Pergamon Press
The Weathermen	D Houghton	Ginn & Co Ltd
Science and the weatherman	T Baker	Pergamon Press
Weather in Britain	E W Young	Edward Arnold Ltd
Geography from Space	E C Barrett	Pergamon Press
Meteorology - introduction to the physics of weather	H J Taubk	Transworld Publishing
Weather study - an approach to Scientific Study (A teacher's guide)	J W Bainbridge & R W Stockdale	Methuen Educational Ltd
British Weather disasters	I Holford	David & Charles
Wind, rain and storm	E H Foxon	Ginn & Co Ltd
Air and Weather	D A Hardy	World's Work Ltd
Weather Observation	Bill Giles	Educational Publications

b) Secondary School and general (* = 6th form only)

Understanding weather	Sir G Sutton	Penguin Books Ltd
The Weather	"	Teach yourself books
The restless atmosphere	F K Hare	Hutchinson University Library
The atmosphere	R A Anther	Bell & Howell (Columbus, Ohio)
Earth, the living planet	H J Bradshaw	Hodder & Stoughton
Weather	P D Thompson & R O'Brien	Time-Life International
Know the weather	C E Wallington & D E Podgley	Educational Publications
The air around us	T J Chandler	Aldus Books
The weather business - observation, analysis, forecasting and weather modification	B W Atkinson	Aldus Books
Outlook (Weather maps and elementary forecasting	G W White	Kandy Publishing Ltd
Interpreting the weather	I Holford	David and Charles
Weather and climate	R C Sutcliffe	Weidenfeld & Nicholson
* Modern meteorology and climatology	T J Chandler	T Nelson & Sons Ltd
* Understanding our atmospheric environment	H Weiburger, J G Edinger & W D Bonner	W H Freeman & Co (San Francisco)
* Atmosphere, Weather and climate	R G Barry & R J Chorley	Methuen & Co Ltd.
Weather and Climate	Svante Bodin	Blandford Press

Fig 6.7(c). Meteorological textbook reference list (page 3).

c. Advanced textbooks, suitable for students at Universities only; emphasis on mathematics and physics.

Introduction to meteorology	S Petterssen	McGraw Hill Book Co Inc
Introduction to theoretical meteorology	S L Hess	H Holt & Co (New York)
Elements of dynamic meteorology	A H Gordon	English University Press
Atmosphere, weather and climate	R G Barry & R J Chorley	Methuen & Co Ltd
Lightning	M A Uman	McGraw Hill Book Co Inc
Numerical Weather prediction	G J Haltiner	J Wiley & Sons Inc (New York)
Synoptic meteorology - methods and applications	R G Barry & A H Perry	Methuen & Co Ltd
Arctic and alpine environment	J D Ives & R G Barry	Methuen & Co Ltd
The changing global environment	S F Singer	D Reidel Publishing Co (Dordrech
The ceaseless wind - an introduction to the theory of atmospheric motion.	J A Dutton	McGraw Hill Book Co Inc
The Physics of atmospheres	J T Houghton	Cambridge University Press
Atmospheric science - an introductory survey	J M Wallace & P V Hobbs	Academic Press (New York)
The ocean - atmospheric system	A H Perry & J M Walker	Longmans
Meteorology - An introductory course. Vol I - Physical processes and motion	A Eliassen & K Pedersen	Universitatsforlaget (Oslo)
Clouds, rain and rainmaking	B J Mason	Cambridge University Press
Introduction to meteorological optics	R A R Tricker	Mills & Boon

d. Applied meteorology.

Methods in Agricultural meteorology	L P Smith	Elsevier
The generation of electricity by wind power	E W Golding	E & F N Spon Ltd
Wind power	D M Simmons	Noyes Data Corp (New Jersey)
Sun power - an introduction to the application of solar energy	J C McVeigh	Pergamon Press
Climate and building in Britain	R E Lacy	Building Research Establishment
Wind loading on bridges and structures	E L Houghton & N B Carruthers	Edward Arnold
Meteorology for seamen	C R Burgess	Brown, Sons & Ferguson (Glasgow)
Basic windcraft. Using the wind for sailing	A Watts	David & Charles Ltd
Meteorology for glider pilots	C E Wellington	John Murray
Principles of environmental physics	J L Monteith	Edward Arnold

Please note that lists c. and d. are only short selections from the wide range of textbooks available. For more comprehensive advice refer to Met O 18/National Meteorological Library.

Fig 6.7(d). Meteorological textbook reference list (page 4).

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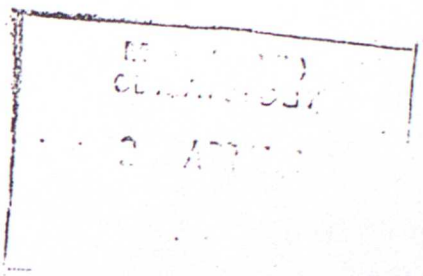
YOUR REF.

OUR REF. GAE/JMT/CP/A4572

23rd April 1981

The Met Office,
Department 3B,
London Road,
Bracknell,
Berks.



Dear Sirs,

Wind Frequency Tables
Scot Bowyers Limited

We are currently advising the above Company in connection with planning matters involving proposals for the construction of a 100 foot chimney at their factory at Newnham, Plymstock.

We should be grateful if you would kindly supply us with the appropriate Wind Frequency Tables for the Plymouth/Plymstock area as soon as is conveniently possible.

We understand that there is a charge for supplying this information and if you would kindly forward the appropriate invoice with the Tables we will arrange immediate payment.

It is possible that we may require more detailed information regarding local wind characteristics in the immediate vicinity of the factory. We should therefore be grateful if you could let us know whether more detailed information could be made available and what the likely cost would be.

We look forward to hearing from you.

Yours faithfully,

Chartered Surveyors

Fig 6.8. The original letter from Gerald Eve and Co.

PC

METEOROLOGICAL OFFICE
London Road Bracknell Berkshire RG12 2SZ

Telex 848160 847010 Telephone 0344 (Bracknell) 20242 ext 2279

Gerald Eve & Co
Chartered Surveyors
18 Savile Row
LONDON
W1X 2BP

Please reply to The Director-General
Your reference
GAE/JMT/CP/A4572
Our reference
D/Met O 3b/1/5/120C
Date
30 April 1981

Dear Sirs

WIND FREQUENCY DATA FOR PLYMOUTH/PLYMSTOCK AREA

With reference to your letter of 23 April 1981, I now enclose copies of the annual and monthly wind frequency tables for Plymouth (Mount Batten) based on the hourly mean wind directions and speeds recorded during the period 1971-1980.

The tables show the percentages of time of winds blowing from certain directions (30 degree sectors, 350° to 010°, 020° to 040° etc) with certain speeds (1 to 3 knots, 4 to 6 knots etc).

With regard to the possibility of our conducting a more detailed wind analysis in the area of the factory, we do not have any data specific to the actual site, however we are quite prepared to discuss the possible problems involved. Any subsequent investigation which such discussions might suggest to be feasible would involve a consultation charge (approximately £35 per hour plus VAT).

It is hoped that this information will be of assistance and an account (No 5499 for £17.25) is also enclosed.

Yours faithfully

Met O 3b

ENCLS

6.9. The letter of reply.

Figs 6.10 to 6.13. Tables sent in reply to C. Eve and Co.

Meteorological Office

Fig 6.10.

PERCENTAGE FREQUENCY OF WIND DIRECTION AND VELOCITY

at PLYMOUTH MOUNTBATTEN 1971 – 1980

Lat. 50°21'N Long. 04°07'W Altitude 51 M ~~ft.~~ above M.S.L.

Height of Vane or Cups — Above Ground 64 M ~~ft.~~ / Above Building ____ ft. No. ____ / Effective Height 13 M ~~ft.~~

Mean Wind Speed			Degrees (true)												All Dir.
Beaufort Force	Knots	M.P.H.	350–10	20–40	50–70	80–100	110–130	140–160	170–190	200–220	230–250	260–280	290–310	320–340	
0	0	0													1.4
1	1–3	1–3	0.9	0.8	1.5	1.8	0.5	0.1	0.1	0.5	0.7	0.9	0.8	1.0	11.2
2	4–6	4–7	1.5	1.3	1.7	2.5	1.0	0.5	0.4	1.6	1.3	1.5	1.4	1.8	16.5
3	7–10	8–12	2.1	1.4	2.1	3.3	1.7	1.2	1.3	3.2	2.5	2.6	2.0	2.5	25.9
4	11–16	13–18	1.6	1.0	2.1	3.0	1.6	1.5	1.8	3.1	4.7	3.8	2.6	2.6	29.3
5	17–21	19–24	0.2	0.1	0.4	0.6	0.3	0.4	0.9	1.4	2.0	1.3	1.0	0.6	9.2
6	22–27	25–31	0.1	0+	0.1	0.2	0+	0.1	0.5	1.1	1.1	0.7	0.4	0.2	4.6
7	28–33	32–38	0+		0+	0+	0+	0+	0.2	0.4	0.4	0.1	0.1	0+	1.3
8	34–40	39–46						0+	0.1	0.2	0.1	0+	0+	0+	0.4
9	41–47	47–54							0+	0+	0+	0+			0.1
10	48–55	55–63								0+	0+	0+			0+
11	56–63	64–72													
12	>63	>72													
Total 4–10 kts															
Total 11–21 kts															
Total 22–33 kts															
Total 34 kts or more															
Total 4 kts or more			5.5	3.8	6.5	9.5	4.6	3.7	5.3	11.1	12.1	10.1	7.5	7.7	87.4

Notes: 0+ = LESS THAN 0.05%

1-3 KTS TOTAL INCLUDES A % VARIABLE

Under 4 kts 12.6 %

TOTAL 100.0 %

Observations missing:

Met. O./Carto/D.O./PUB/P/22

METEOROLOGICAL OFFICE Fig 6.11.

% AGE

FREQUENCY OF WIND DIRECTION AND VELOCITY

Station PLYMOUTH MOUNTBATTEN Altitude VANE 64 M above M.S.L.

Latitude 50° 21' N Longitude 04° 07' W

*Month/~~Hours~~ Period 1971 - 80

Mean Wind Speed		Degrees (true)												All directions
Beaufort Forces	Knots	350-10	20-40	50-70	80-100	110-130	140-160	170-190	200-220	230-250	260-280	290-310	320-340	
		*~~Time~~/Month SEPTEMBER												
0	0													1·8
1	1-3	1·0	1·1	2·3	2·2	0·6	0·2	0·2	0·4	0·9	0·9	1·2	1·1	14·2
2	4-6	1·6	1·3	1·8	2·5	1·2	0·5	0·6	1·7	1·4	1·9	1·6	1·6	17·6
3	7-10	2·4	1·1	2·0	3·4	1·4	0·9	1·9	3·6	2·5	2·5	1·5	2·1	25·3
4	11-16	1·6	0·6	1·6	3·0	1·3	0·9	2·1	3·9	5·3	4·2	2·6	1·9	29·2
5	17-21	0·1	0+	0·1	0·6	0·1	0·2	0·7	1·0	2·2	1·4	1·0	0·6	7·9
6	22-27	0+	0+	0·1	0·1		0+	0·3	0·3	0·7	0·5	0·4	0·1	2·6
7	28-33						0+	0+	0·2	0·3	0·1	0·1		0·7
8	34-40							0·1	0·1	0·2	0+			0·5
9	41-47									0+				0+
≥10	48 and over													
Total 4 kts or more		5·8	3·1	5·5	9·6	4·1	2·5	5·7	10·9	12·7	10·7	7·1	6·2	84·0
		Observations missing									Under 4 kts			10·0
											Total			100·0
		*~~Time~~/Month OCTOBER												
0	0													1·4
1	1-3	1·0	1·1	1·4	2·3	0·7	0·1	0·2	0·3	0·4	0·7	0·9	1·1	12·0
2	4-6	1·3	1·2	1·8	3·4	1·7	0·6	0·7	1·2	0·7	1·3	1·7	1·6	17·3
3	7-10	1·5	1·1	2·2	3·7	3·2	2·1	1·4	1·6	2·0	2·1	1·9	2·2	25·0
4	11-16	1·7	0·9	3·1	1·9	3·2	2·8	2·8	2·9	3·4	3·5	2·6	2·2	31·0
5	17-21	0·4	0·2	0·7	0·6	0·4	0·4	1·5	1·7	1·2	0·8	0·5	0·4	8·3
6	22-27	0·1		0·1	0·1		0·1	0·4	1·0	0·7	0·4	0·2	0·2	3·3
7	28-33	0+						0·1	0·3	0·3	0·1	0·1		0·9
8	34-40							0+	0·1	0·1	0+	0·1		0·3
9	41-47													
≥10	48 and over													
Total 4 kts or more		5·0	3·3	7·8	9·7	8·0	6·1	6·9	8·8	8·4	8·3	7·0	6·7	86·6
		Observations missing									Under 4 kts			13·4
											Total			100·0
		*~~Time~~/Month NOVEMBER												
0	0													1·5
1	1-3	1·0	0·9	1·6	2·3	0·5	0·1	0·1	0·2	0·3	0·6	0·8	1·1	11·3
2	4-6	1·7	1·3	1·9	2·5	0·7	0·4	0·4	0·5	0·5	1·2	1·7	1·6	14·5
3	7-10	2·4	1·4	1·8	2·3	1·1	0·7	1·0	1·0	1·8	3·1	2·7	2·4	21·7
4	11-16	1·8	0·8	2·0	1·3	0·9	0·6	0·9	2·7	4·9	5·5	3·0	2·4	26·9
5	17-21	0·5	0·4	0·4	0·2	0+	0·2	0·7	1·8	3·2	2·5	1·6	0·7	12·3
6	22-27	0·1		0·1	0+		0+	0·4	2·7	2·3	1·7	0·9	0·2	8·6
7	28-33							0·1	1·2	0·5	0·2	0·3		2·3
8	34-40							0·1	0·3	0·3	0+			0·8
9	41-47								0+	0+				0·1
≥10	48 and over													
Total 4 kts or more		6·5	3·9	6·2	6·3	2·7	2·0	3·6	10·4	13·7	14·3	10·2	7·3	87·1
		Observations missing									Under 4 kts			12·9
											Total			100·0
		*~~Time~~/Month DECEMBER												
0	0													1·5
1	1-3	0·7	0·8	1·4	2·0	0·6	0·1	0+	0·2	0·2	0·4	0·6	0·6	4·6
2	4-6	1·1	1·5	1·5	3·4	1·2	0·3	0·1	0·2	0·5	1·3	1·5	1·3	13·8
3	7-10	1·5	1·3	1·7	1·9	1·3	0·7	0·9	0·8	1·6	2·5	2·0	1·2	17·2
4	11-16	1·0	1·2	1·5	2·0	2·3	2·8	1·9	2·2	5·0	4·9	3·3	1·5	29·7
5	17-21	0·2	0·2	0·4	0·2	0·9	1·1	1·1	1·9	3·5	2·6	1·2	0·7	14·0
6	22-27	0·1		0·2	0·2	0·2	0·5	0·9	2·4	2·7	1·6	0·8	0·3	9·8
7	28-33	0+						0·4	0·9	1·0	0·4	0·2		2·9
8	34-40							0·1	0·3	0·5	0·1	0+		1·2
9	41-47							0·1	0·1	0·1	0·1			0·3
≥10	48 and over									0+	0+			0+
Total 4 kts or more		3·9	4·1	5·2	7·7	6·0	5·4	5·5	8·9	14·8	13·5	9·1	4·9	88·9
		Observations missing									Under 4 kts			11·1
											Total			100·0

Notes:- *Delete as applicable 0+ = LESS THAN 0·05%

1-3 KTS TOTAL INCLUDES A % VARIABLE

METEOROLOGICAL OFFICE

Fig 6.12.

FREQUENCY OF WIND DIRECTION AND VELOCITY

Station PLYMOUTH MOUNTBATTEN Altitude VANE 64M above M.S.L.

Latitude 50° 21'N Longitude 04° 07'W

*Month/~~Hours~~ Period 1971 - 80

Mean Wind Speed		Degrees (true)												All directions
Beaufort Forces	Knots	350-10	20-40	50-70	80-100	110-130	140-160	170-190	200-220	230-250	260-280	290-310	320-340	
		*~~Time~~/Month MAY												
0	0													1·2
1	1-3	0·7	0·7	1·2	1·6	0·4	0·1	0·2	1·0	1·1	1·0	0·7	1·1	11·1
2	4-6	1·8	1·1	1·2	1·3	0·8	0·4	0·3	2·3	1·7	1·6	1·1	2·0	15·8
3	7-10	2·1	1·8	2·7	4·0	1·6	1·1	1·3	4·7	3·7	2·2	1·3	2·2	27·9
4	11-16	1·7	2·1	3·5	5·2	1·3	1·4	2·2	4·2	4·1	2·5	1·9	2·6	32·5
5	17-21	0·1	0·1	0·3	1·1	0·2	0·2	0·9	1·1	1·8	0·5	1·0	0·4	7·8
6	22-27		0+	0+	0·1	0+	0+	0·1	0·5	0·7	0·1	0·3	0·1	3·0
7	28-33							0·1	0+	0·1	0+	0+		0·4
8	34-40							0+	0+					0·1
9	41-47													
≥10	48 and over													
Total 4 kts or more		5·7	5·2	8·1	11·6	3·9	3·2	5·6	13·0	11·2	6·9	5·8	7·4	87·7
		Observations missing									Under 4 kts			12·3
											Total			100·0
		*~~Time~~/Month JUNE												
0	0													1·0
1	1-3	0·6	0·3	1·3	1·6	0·5	0·1	0·1	0·7	1·7	1·4	0·8	0·9	11·4
2	4-6	1·4	1·4	1·7	2·2	0·5	0·4	0·5	2·7	2·5	1·9	1·3	2·3	19·0
3	7-10	2·0	0·9	1·9	3·1	1·0	0·5	1·2	0·6	4·7	2·5	2·6	3·0	33·3
4	11-16	1·1	0·4	1·5	2·9	1·1	0·3	1·3	3·7	5·5	4·3	3·3	4·3	30·0
5	17-21	0+	0+	0·1	0·6	0·1		0·5	0·8	0·9	1·1	0·5	0·3	4·9
6	22-27				0·1			0·1	0·3	0·4	0·3	0·1	0·1	1·3
7	28-33								0·1	0·1				0·1
8	34-40													
9	41-47													
≥10	48 and over													
Total 4 kts or more		4·6	2·7	5·2	8·9	3·3	1·2	3·6	14·1	14·1	11·2	7·9	10·7	87·6
		Observations missing									Under 4 kts			12·4
											Total			100·0
		*~~Time~~/Month JULY												
0	0													1·6
1	1-3	0·9	0·5	1·4	1·5	0·3	0·2	0·1	1·0	1·1	1·3	0·7	1·2	11·4
2	4-6	2·0	1·0	1·5	2·0	0·6	0·5	0·5	3·3	2·4	2·3	1·4	3·2	20·6
3	7-10	2·6	0·9	1·5	3·1	1·2	1·1	1·5	0·5	4·5	3·3	2·5	4·6	33·2
4	11-16	1·1	0·2	0·6	2·3	0·4	0·6	1·2	3·6	7·2	3·5	2·9	4·0	27·7
5	17-21	0+			0·3	0+	0+	0·2	1·4	1·3	0·4	0·5	0·3	4·6
6	22-27							0·1	0·4	0·3	0+	0·1	0+	0·9
7	28-33								0+	0+				0·1
8	34-40													
9	41-47													
≥10	48 and over													
Total 4 kts or more		5·8	2·0	3·5	7·8	2·2	2·2	3·4	15·2	15·7	9·5	7·5	12·2	97·0
		Observations missing									Under 4 kts			13·0
											Total			100·0
		*~~Time~~/Month AUGUST												
0	0													1·8
1	1-3	1·5	0·9	2·0	2·1	0·5	0·1	0·3	0·9	1·2	1·5	1·1	1·5	14·3
2	4-6	2·0	1·2	1·3	2·6	0·7	0·5	0·4	2·8	2·3	1·8	1·8	1·9	19·2
3	7-10	2·6	0·9	1·7	3·6	1·2	1·2	1·6	0·3	4·2	2·9	2·2	2·9	31·3
4	11-16	1·2	0·3	0·9	3·5	1·2	0·7	1·4	4·5	5·4	2·5	1·9	2·4	26·1
5	17-21	0+		0+	0·2	0·1	0+	0·7	1·3	1·3	0·6	0·5	0·3	5·0
6	22-27				0+	0+	0+	0·2	0·7	0·4	0+	0·1	0+	1·5
7	28-33							0·1	0·2	0·1				0·4
8	34-40							0·1	0+					0·1
9	41-47													
≥10	48 and over													
Total 4 kts or more		5·8	2·4	3·9	10·2	3·2	2·4	4·4	15·7	13·7	7·7	6·4	7·5	83·4
		Observations missing									Under 4 kts			16·6
											Total			100·0

Notes:- *Delete as applicable 0+ = LESS THAN 0·05%

1-3KTS TOTAL INCLUDES A % VARIABLE

METEOROLOGICAL OFFICE

FREQUENCY OF WIND DIRECTION AND VELOCITY

Station PLYMOUTH MOUNTBATTEN Altitude VANE 64 M above M.S.L.

Latitude 50° 21' N Longitude 040 07' W

*Month/~~Hours~~ Period 1971 - 80

Mean Wind Speed		Degrees (true)												All directions
Beaufort Forces	Knots	350-10	20-40	50-70	80-100	110-130	140-160	170-190	200-220	230-250	260-280	290-310	320-340	
		*~~Time~~/Month JANUARY												
0	0													1·2
1	1-3	0·7	0·9	1·5	1·5	0·6	0·1	0·1	0·3	0·5	0·6	0·9	1·0	10·4
2	4-6	1·3	1·0	1·2	2·7	1·2	0·4	0·3	0·4	0·5	1·0	1·4	1·2	12·6
3	7-10	1·5	1·3	1·3	2·3	1·7	1·2	1·0	0·7	1·1	2·9	2·0	1·3	18·4
4	11-16	1·2	1·1	1·4	1·0	0·9	2·2	2·2	2·1	4·7	5·4	3·2	1·3	26·6
5	17-21	0·1	0·1	0·4	0·5	0·5	1·5	2·1	2·1	3·0	2·2	1·9	0·7	14·9
6	22-27	0·1		0·2	0·8	0·1	0·6	1·7	2·3	1·5	1·1	1·1	0·7	10·3
7	28-33	0+			0·1	0+	0·1	0·9	1·1	0·8	0·3	0·3	0·1	3·8
8	34-40						0+	0·5	0·3	0·3	0·1	0+	0+	1·3
9	41-47							0·1	0·1	0·1	0+			0·3
≥10	48 and over								0+					0+
Total 4 kts or more		4·2	3·5	4·5	7·5	4·4	6·1	8·7	9·1	12·1	13·1	9·8	5·4	88·4
		Observations missing											Under 4 kts	11·6
													Total	100·0
		*~~Time~~/Month FEBRUARY												
0	0													1·7
1	1-3	0·4	0·4	1·0	1·9	0·9	0·2	0·2	0·3	0·6	0·7	0·6	0·5	8·5
2	4-6	0·7	1·2	1·9	2·9	2·4	1·1	0·6	1·2	0·9	1·5	1·0	1·2	10·5
3	7-10	1·2	1·4	1·9	3·7	3·5	2·3	1·8	1·4	1·6	2·3	1·6	1·4	24·3
4	11-16	0·8	0·8	1·9	4·6	2·9	2·6	2·7	2·4	2·6	3·6	2·0	1·4	26·4
5	17-21	0·2	0·3	0·7	1·7	0·5	0·6	1·1	1·6	1·6	1·4	1·1	0·4	11·2
6	22-27	0+	0+	0+	0·9	0·1	0·3	0·7	1·1	1·5	0·7	0·5	0·2	5·9
7	28-33				0·3	0+	0+	0·4	0·6	0·6	0·2	0·2		2·4
8	34-40							0·3	0·2	0·1				0·6
9	41-47							0+	0+					0+
≥10	48 and over													
Total 4 kts or more		2·9	3·7	6·5	14·1	9·5	7·0	7·7	8·5	8·8	9·7	6·5	4·6	89·4
		Observations missing											Under 4 kts	10·6
													Total	100·0
		*~~Time~~/Month MARCH												
0	0													1·7
1	1-3	0·6	0·7	1·2	1·4	0·5	0·2	0·1	0·4	0·5	0·5	0·5	0·6	8·0
2	4-6	1·2	1·4	2·2	2·8	0·8	0·5	0·3	1·4	0·9	0·9	0·8	1·4	14·6
3	7-10	2·9	2·1	3·5	4·1	1·6	1·6	1·3	1·9	1·7	1·9	1·4	2·0	25·9
4	11-16	2·3	1·9	2·6	3·6	1·9	1·5	2·2	3·3	4·8	3·5	1·5	1·9	31·0
5	17-21	0·3	0·4	0·6	0·3	0·3	0·3	1·5	2·1	2·4	1·6	1·1	0·9	11·6
6	22-27	0·1	0·1	0·3	0+	0+	0·1	0·8	1·3	1·1	1·1	0·4	0·5	5·7
7	28-33			0+				0·1	0·5	0·3	0·2	0·1		1·2
8	34-40							0+	0·2	0·1	0+			0·3
9	41-47								0+	0+				0+
≥10	48 and over													
Total 4 kts or more		6·7	5·9	9·2	10·7	4·7	3·9	6·2	10·6	11·3	9·2	5·3	6·6	90·3
		Observations missing											Under 4 kts	9·7
													Total	100·0
		*~~Time~~/Month APRIL												
0	0													0·8
1	1-3	1·2	1·1	1·7	1·3	0·3	0·1	0·2	0·8	0·4	0·7	0·8	1·3	11·1
2	4-6	2·3	2·0	2·1	1·8	0·7	0·3	0·5	1·3	1·2	1·0	1·0	2·1	10·3
3	7-10	3·1	2·1	3·7	3·8	0·9	1·2	0·8	2·8	1·7	1·9	1·9	3·7	27·6
4	11-16	3·2	2·0	4·9	4·1	1·5	1·1	0·7	2·0	2·7	2·4	2·9	4·9	32·4
5	17-21	0·7	0+	0·9	0·8	0·1	0·1	0·3	0·4	1·5	1·1	0·7	1·0	7·9
6	22-27	0·2			0+		0+	0·1	0·7	1·0	0·4	0·4	0·3	3·2
7	28-33	0·1						0·1	0·1	0·3	0+	0+	0+	0·6
8	34-40								0·1	0+				0·2
9	41-47													
≥10	48 and over													
Total 4 kts or more		9·5	6·0	11·7	10·5	3·3	2·7	2·5	7·6	8·4	6·8	6·9	12·0	88·1
		Observations missing											Under 4 kts	11·9
													Total	100·0

Notes:- *Delete as applicable 0+ = LESS THAN 0.05%

1-3 KTS TOTAL INCLUDES 4% VARIABLE

GERALD EVE & CO.

INCORPORATING SIDNEY & GRAHAM MOTION

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CARDIFF, GLASGOW, LIVERPOOL, BRUSSELS

YOUR REF. D/Met O 3b/1/5/120C

OUR REF. GAE/JMT/CP/A4572

5th May 1981

Esq.,
Met O 3b,
Meteorological Office,
London Road,
Bracknell,
Berkshire,
RG12 2SZ.

Dear Sir,

Wind Frequency Data for Plymouth/Plymstock Area

Thank you for your letter dated 30th April together with enclosed Frequency of Wind Direction and Velocity Tables, and account in the sum of £17.25 inclusive of V.A.T.

Sent to Cashier 6/5

We enclose herewith our cheque in payment of your abovementioned account.

We will contact you in due course if it is decided that a further site specific investigation is required but in the meantime we note the basis of your consultation charge.

Yours faithfully,

Gerald Eve & Co.

Chartered Surveyors

Encs.

Fig 6.14. Letter of acknowledgement from G. Eve and Co.

Fig 6.15: A possible reply to G Eve & Co.

METEOROLOGICAL OFFICE
London Road Bracknell Berkshire RG12 2SZ

Telex 848160 847010 Telephone 0344 (Bracknell) 20242 ext

Please reply to The Director-General
Your reference

Our reference

Date

Dear Sirs

RE: SCOT BOWYERS PROPOSED CHIMNEY

We are pleased to help you with meteorological aspects of the Scot Bowyers Chimney proposal. We are fortunate to have good wind records for a station near to the Plymstock factory site, this being Plymouth, Mount Batten. As requested, we have sent appropriate wind frequency tables and have also included an average yearly wind rose and also a wind rectangle. Both of these are computer plots of the tabulated data and we hope they are of use.

The meteorological influence on construction is an area in which the Met. Office is steadily acquiring expertise. In your case of the construction of a 100 ft high chimney, we can give useful advice on the wind stresses on such structures and also on the dispersion of effluent from chimneys.

Several aspects would be considered. For example, topography has an important modifying effect on wind regimes. Also, coastal sites have different characteristics to inland sites. Consideration of these would lead to a design for expected stresses in the local environment.

The dispersion of effluent from chimneys is not only dependent on wind velocity which changes with height, but also atmospheric-stability, ie the change of temperature and wind with height. We could make an investigation of these for you. This would help avoid local people being unnecessarily affected by the chimney effluent and ensuring complaint to Scot Bowyer.

If you would like to discuss this further please telephone the above number. We would give you more details of our consultancy service, the benefits to you and the likely fee.

Yours faithfully

Mr A D Vise

Fig 6.15. A possible letter of reply to G. Eve and Co, suggesting possible services.

PERCENTAGE FREQUENCY OF MEAN WIND DIRECTION AND SPEED

MOUNTBATTEN DCNN 8811 SITE NO 1 YEAR1970-YEAR1980

HEIGHT OF VANE ABOVE M.S.L. 64 METRES
HEIGHT OF VANE ABOVE GROUND 13 METRES
ESTIMATED EFFECTIVE HEIGHT 13 METRES

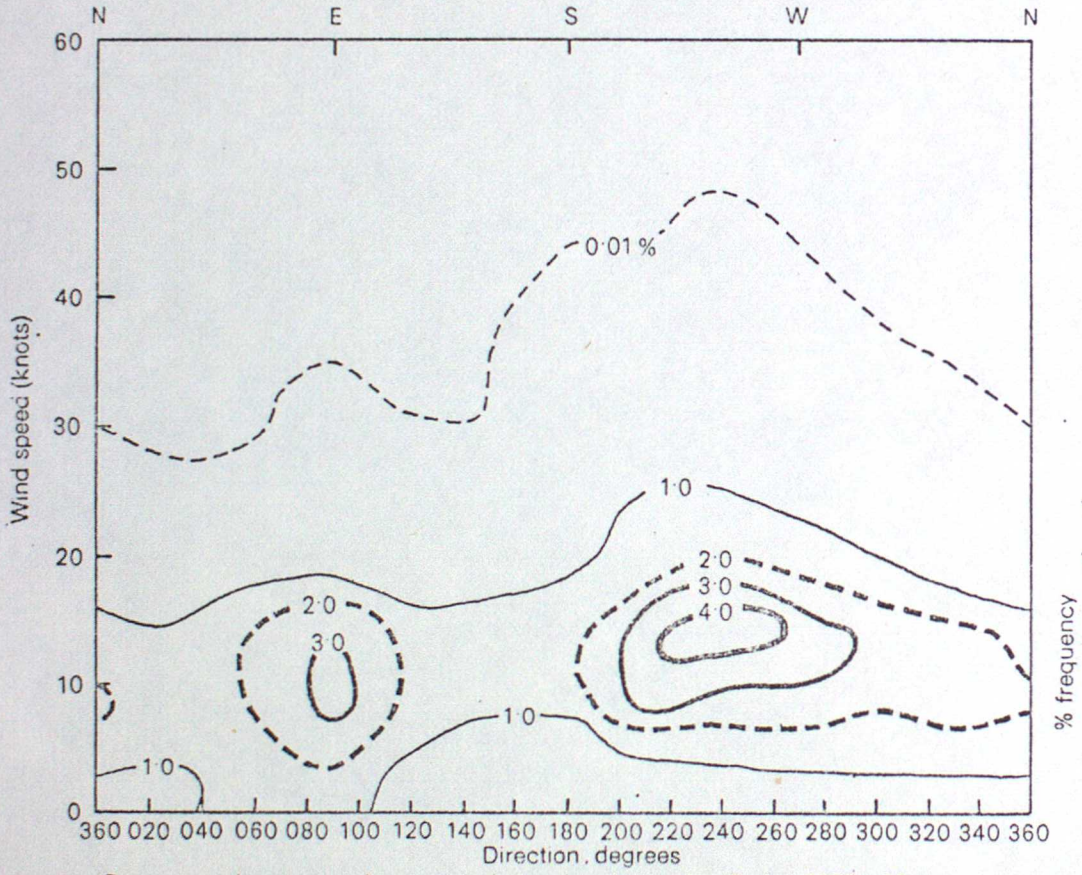
MEAN SPEED KNOTS	TOTAL NUMBER OF HOURS FROM (DEGREES TRUE) 350 -010	020 -040	050 -070	080 -100	110 -130	140 -160	170 -190	200 -220	230 -250	260 -280	290 310	320 -340	VARIABLE	DIRECTION ONLY MISSING	TOTAL
CALM	-	-	-	-	-	-	-	-	-	-	-	-	-		1.62
1- 3	0.82	0.75	1.41	1.71	0.50	0.14	0.14	0.52	0.71	0.84	0.80	0.99	1.29	0.0	10.61
4- 6	1.51	1.24	1.61	2.44	1.02	0.48	0.43	1.56	1.29	1.50	1.39	1.80	0.04	0.0	16.32
7-10	2.18	1.36	2.05	3.24	1.70	1.22	1.28	3.22	2.51	2.71	2.08	2.55	0.00	0.0	26.10
11-16	1.56	1.04	2.08	2.96	1.57	1.49	1.77	3.12	4.09	3.85	2.72	2.72	0.0	0.0	29.59
17-21	0.26	0.14	0.40	0.58	0.29	0.41	0.90	1.37	2.04	1.56	1.00	0.80	0.0	0.0	9.36
22-27	0.06	0.02	0.11	0.19	0.04	0.14	0.52	1.10	1.14	0.66	0.47	0.27	0.0	0.0	4.66
28-33	0.01	0.00	0.00	0.03	0.01	0.01	0.18	0.40	0.38	0.13	0.09	0.02	0.0	0.0	1.27
34-40	0.0	0.0	0.0	0.0	0.0	0.00	0.10	0.15	0.13	0.02	0.01	0.00	0.0	0.0	0.41
41-47	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.01	0.02	0.01	0.0	0.0	0.0	0.0	0.05
48-55	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.0	0.0	0.0	0.0	0.01
56-63	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
OVER63	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SPEED ONLY MISSING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0
TOTAL 4KT OR MORE	5.59	3.80	6.25	9.47	4.62	3.75	5.19	10.94	12.19	10.26	7.76	7.91	0.04	0.0	87.77

TOTAL 100.00

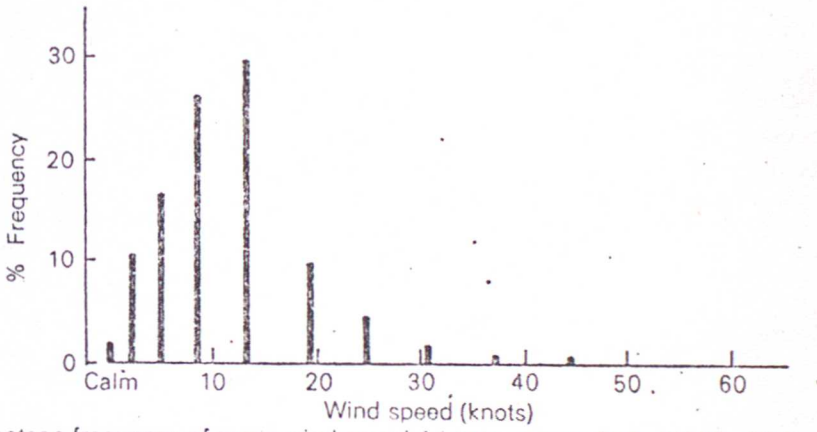
DEFECTIVE RECORDS 0.0

Fig 6.16. Percentage frequencies of wind velocities at Plymouth Mount Batten, 1970–1980.
(Produced using the Data Sort Programme of Met O 9).

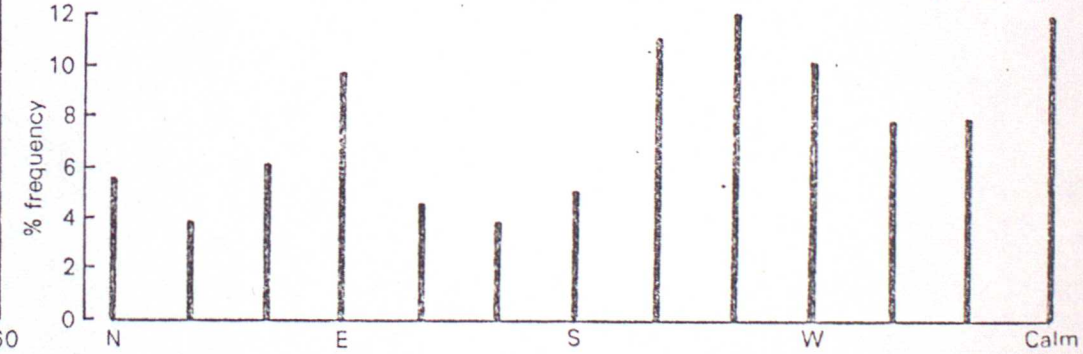
PLYMOUTH–MOUNT BATTEN



Percentage frequency of mean wind speed and direction Period 1970–80 (inclusive)



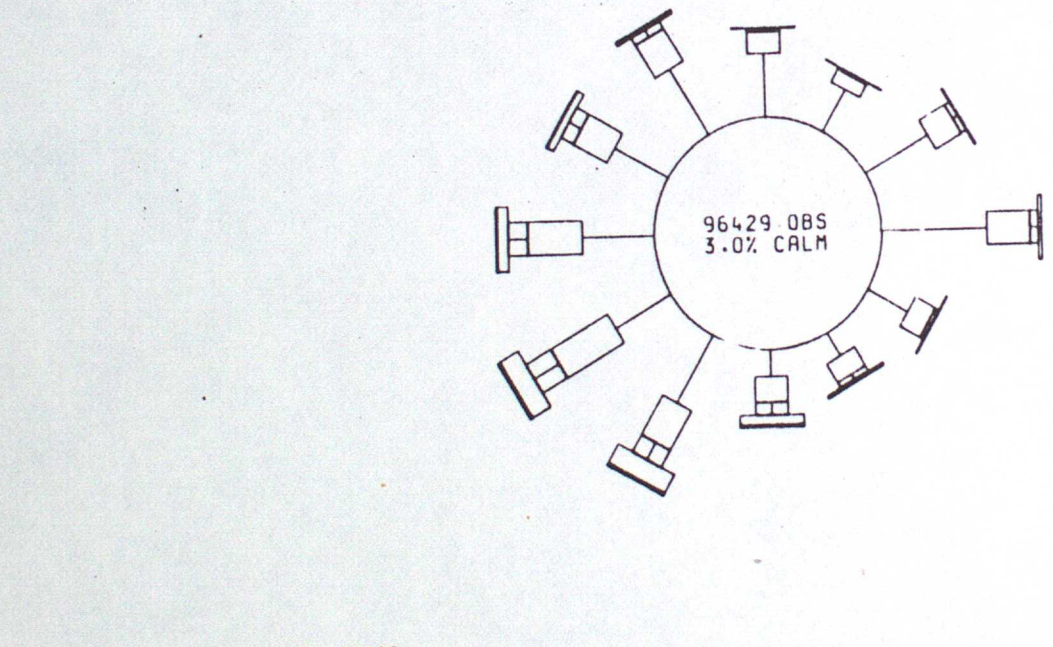
Percentage frequency of mean wind speed 4 knots or more Period 1970–80 (inclusive)



Percentage frequency of mean wind directions, 30 degree sectors Period 1970–80 (inclusive)

Fig 6.17. 'Wind velocity rectangle' and wind histograms.

Fig 6.18. A wind rose for Plymouth Mount Batten 1970–1980.



JB

'INFORMATION TECHNOLOGY'

Growth in the electronics industry is at a very fast pace. In everyday life there have been many changes in the past ten years due to the application of electronics: cash dispensing machines, pocket calculators, watch mechanisms, video recorders. A major reason for the widespread use of electronics, particularly noticeable in consumer uses, has been the mass production and so low cost, of 'high-technology microelectronics'.

The field of microelectronics is now combining with computing and telecommunications to create the new discipline of 'Information Technology'. Information Technology, or 'IT' for short, promises to "revolutionise the handling, processing and storing of information" ('Information Technology', Department of Industry leaflet).

Two definitions of IT help to convey what is involved in the new discipline.

"The acquisition, processing, storage and dissemination of vocal, pictorial, textual and numerical information by a microelectronics-based combination of computing and telecommunications". (D. of I.).

" .. the use of computers, to help us produce, store, obtain and send information in the form of pictures, words or numbers, more reliably, quickly and economically". (The Times, 14.1.82).

Information is the commodity in which Met O 3b trade. As such it is both necessary and prudent to examine the field of IT.

2. Information Technology in the Office

Some IT equipment is new in concept, though some are refinements of older methods using microelectronic technology. IT equipment in use in offices includes:

Copiers/duplicators
PAX (Private Automatic Exchange) - sophisticated telephone exchanges
Electronic message transmission
Personal (ie, small) computers
Telex, teleprinters, facsimile
Electronic typewriters
Viewdata eg PRESTEL
Data processing terminals, with capability to give graphic displays
Word processors

Experience has been gained of both graphics from small computers and word processors. These are now discussed.

2.1 Small computer graphics

In chapter 6, greater use of graphical presentation is advocated in customer replies. Apart from the 'professional' appearance of diagrams, they also convey quickly what would take many words. The prime benefit of graphics is therefore, the improved comprehension of the information. Consider for example, chapter 5 without the graphs.

There are many graphical forms in use in the Met Office, from tephigrams and isobaric charts to time series graphs with trend lines and films of satellite or radar sequences. Many of the diagrams in forecasting use are computer plotted already. This is because of the greater speed at which computer methods can produce the diagrams compared to manual methods. Also, because of the volume of diagrams needed it becomes more economical to use computer methods to produce graphics.

In the field of forecasting, the computer graphics are obtained by linking the computer to the observational database, i.e., the data are not entered in from a keyboard. For a graphics system dedicated to enquiry services, this linkage to a database would be essential (though the facility to enter data via a keyboard would of course be useful). An enquiry graphics system would need to be able to produce high quality hardcopy of diagrams displayed on a VDU; this is possible with available printers. For projection it is also possible to produce slides from a VDU screen.

The use of graphics in enquiry work can be divided broadly into two areas, presentation and management decision. There is overlap, not unexpectedly.

a. Presentation

This includes the diagrams of climatic data that should be sent to customers and those used for research purposes. The wind rose, histograms and 'wind rectangle' produced for an example reply in chapter 6 (Figs 6.17 and 6.18) are the sort of diagrams that should be easily available to an enquiry service. Other features that an enquiry computer should have is the ability to display tabulated data and then immediately produce from that data a histogram, pie chart or time series graph as deemed appropriate. If a customer requests return period information, then an extreme value analysis should be available. The facility for diagrams to be quickly produced and variations tried easily will no doubt be found useful by people outside the enquiry bureau.

b. Management decision

A large part of this report has advocated obtaining information about what is actually happening in the enquiry service and doing this as near as possible to when the event in question occurred. It is for this purpose that IT is so important to the commercial world, so as to improve such work as accounts outstanding, financial planning, production control, etc. Efficient management of enquiry services requires up-to-date information and graphics will help in its comprehension. Consider for example the graphs in Appendix 8 and Chapter 5. The histograms of 1981 charges took over a month to produce as the raw data had to be transcribed by hand, then punched onto cards before a statistical package was used to produce the diagrams. Up-to-date diagrams of this nature could be available on demand from an enquiry graphics system. Similarly the calculation and display of trend lines should be possible.

Other possibilities for management purposes could include question-and-answer listings, e.g., to produce JCL to run programmes, list office procedures, produce flow diagrams, staff hierarchy and so on.

Examples of financial diagrams produced from a small computer are shown in Figs 7.1 to 7.3. It should be noted that this system uses four colours (black, blue, red and green) to good effect.

2.2 Word processors

Word processors may be regarded as the most significant recent innovation in office equipment. They are computers that store and allow easy manipulation of text. A explanatory text on 'Uniword processing' from Universal Computers Ltd is available in Appendix 9. It illustrates well Word

processor (WP) capabilities, but the inclusion of this text is in no way meant to advocate this particular system. Indeed not only are there alternative systems but also alternative instruction keying methods.

The WP will store, usually on magnetic 'disk' a standard text or new text that is entered in from a keyboard. In both cases the text can be recalled and altered in many ways, from insertion or deletion, to swapping the position of paragraphs. This work is displayed on a VDU (visual display unit). The original or altered text can be returned to memory as desired. Some of the usual WP facilities are worth noting:

WRAPROUND. The WP automatically shifts words from the end of one line to beginning of next to avoid splitting of words. This occurs with deletion or insertion of text and as a continuous stream of words is entered.

TEXT DELETION/INSERTION. This is similar to TSO FORTRAN editing but with 'wraparound'. Whole blocks of text can be moved (sentences, paragraphs) e.g. from the end of a letter to the beginning.

RIGHT-JUSTIFICATION. (See Fig 7.4). With this facility in use, text is automatically evenly spaced on each line to ensure the text always ends in the same column. Without this facility in use, the appearance is of typed letters.

COLUMN ALIGNMENT. This allows easy setting-up of tabulated data.

HEADING/FOOTING. Text such as 'Crown Copyright' could automatically be inserted at top or bottom of every page.

FORMATTING. Vertical spacing and line length can be altered without re-keying of text. Text also could be entered from the left-hand margin and then centred e.g. for table heading.

MERGING. Merging of data sets is possible e.g. letter and data or lists of addresses and standard letters (see Fig 7.5).

PRINTING. Hard copy can be obtained in various forms and type quality; importantly, letter sheets can be accommodated.

Through WP are powerful tools, it is to be emphasised that the greatest gains in efficiency are obtained where text is frequently repeated for different outlets (i.e. customers for 3b) or where a document is long (e.g. Climatic Memoranda). Thus, some standardisation of letters would bring most benefit. Student letters and solicitors spring to mind as most obvious candidates. Student letters because often no revenue is gained and solicitors letters because they are numerous and usually need a brief statement of weather at a particular time and place.

3. <u>The implications of IT for enquiry services</u>

The Climatological Enquiry Bureau is not only heavily involved in office work but it's trade is the dissemination of information derived from the meteorological and climatological records (the 'database'). Clearly, the introduction of a (small) computer system dedicated to enquiry services, with WP and graphics capabilities would have a profound affect in the manner of production and content of customer

replies. At present each process in office procedure and preparation of a reply is carried out in separate acts e.g., the data is collected, the required table is sent for photocopying, a particular record is made in a particular book etc. With the introduction of IT into the enquiry bureau, most if not all of the work could be carried out via a keyboard and VDU.

'Work station' is the term used for an IT set-up that allows all work to be transacted from one desk, equipped with a terminal linked to a computer. In a 1980 EDP article (see references), the work station discussed gave the following facilities from one terminal:-

i. Word Processing

ii. Message system. Instead of internal mail a message could be sent from one terminal to another irrespective of whether the recipient terminal was in use.

iii. Diary listings and reminders given at set times.

iv. Calculator abilities

v. Database access mode. The system described was in a bank and could access the on-line data, presumably financial indices and the like.

vi. Handling office files. This included records and memos.

vii. Programming mode. This allowed a computer language (BASIC) to be accepted.

viii. Graphics capability.

The machine was described as 'multi-function'. It was intended to provide many of the services needed to perform the overall job. It sought to replace to a large extent, the internal telephone, calculator, internal mail, memos, paper filing space, etc. It would radically alter the face of any traditional office.

One therefore has to conjure up an image of IT put to work in the enquiry bureau. A request would arrive and be stored. This may be a letter or some form of message sent to the terminal. When dealt with the data would be called up using a keyboard and would be displayed on the VDU. As the climate dataset is large then the system may need to be linked to COSMOS. The data accession commands may be entered from the terminal and the job run overnight. The data would then be 'collected' by the enquiry system and held for as long as necessary. Alternatively, if a smaller database (associated with the services computer) were to be used then only the most frequently needed data may be held. It may be best that as much data as possible was held in tabulated frequency form and offered to customers as a package: customers may then be offered, e.g. the 10 year averages at one rate but if they insisted on a different averaging period, COSMOS would be used and a higher charge made. Overall, the large amount of observational data held at the office should not be regarded as a stumbling block.

Once the appropriate data is stored by the enquiry system, it could be tabulated and annotated using WP facilities. Any desired graphical output would be produced. A covering text would be recalled from store and altered as necessary to suit the particular enquiry. The letter, tables and diagrams would be printed as completed on a adjacent high-quality printer.

The necessary records would then be entered. The staff time involved would be input to a charge calculation routine and an invoice automatically produced. The name and address could be recalled and printed onto an envelope.

The material necessary for the reply would now be complete and the reply can be sent. This may, in time to come, not be by post but electronically to a customers terminal.

For management purposes, the same terminals would allow up-to-date analysis as the raw data for business statistics would be stored as soon as the job was completed. Such work would require a separate suite of programmes. The software may possibly be bought 'off-the-shelf'. It would be possible to obtain answers on questions about numbers of enquiries in the past month, income both overall and by type. Enquiry analysis via the ECC (Chapter 3) could be carried out as the basis for marketing work. For the first time management would have the information readily available for bureau policy decisions.

The working environment described above is a possibility now, not a 'futuristic vision'. The Govenment has declared 1982 to be 'Information Technology Year' to publicise the ready availability of such equipment. However, criticism of a rush to introduce IT without the social consequences being fully considered, is occasionally voiced in computing and other similar journals.

The introduction of IT does, and will, have ramifications outside the field for which it was intended; they are not the concern of this report but they are a matter that should be considered. Within this field, the use of IT in 3b could lead to less movement and so less contact with other people, which is not necessarily a desirable consequence.

CONCLUSION

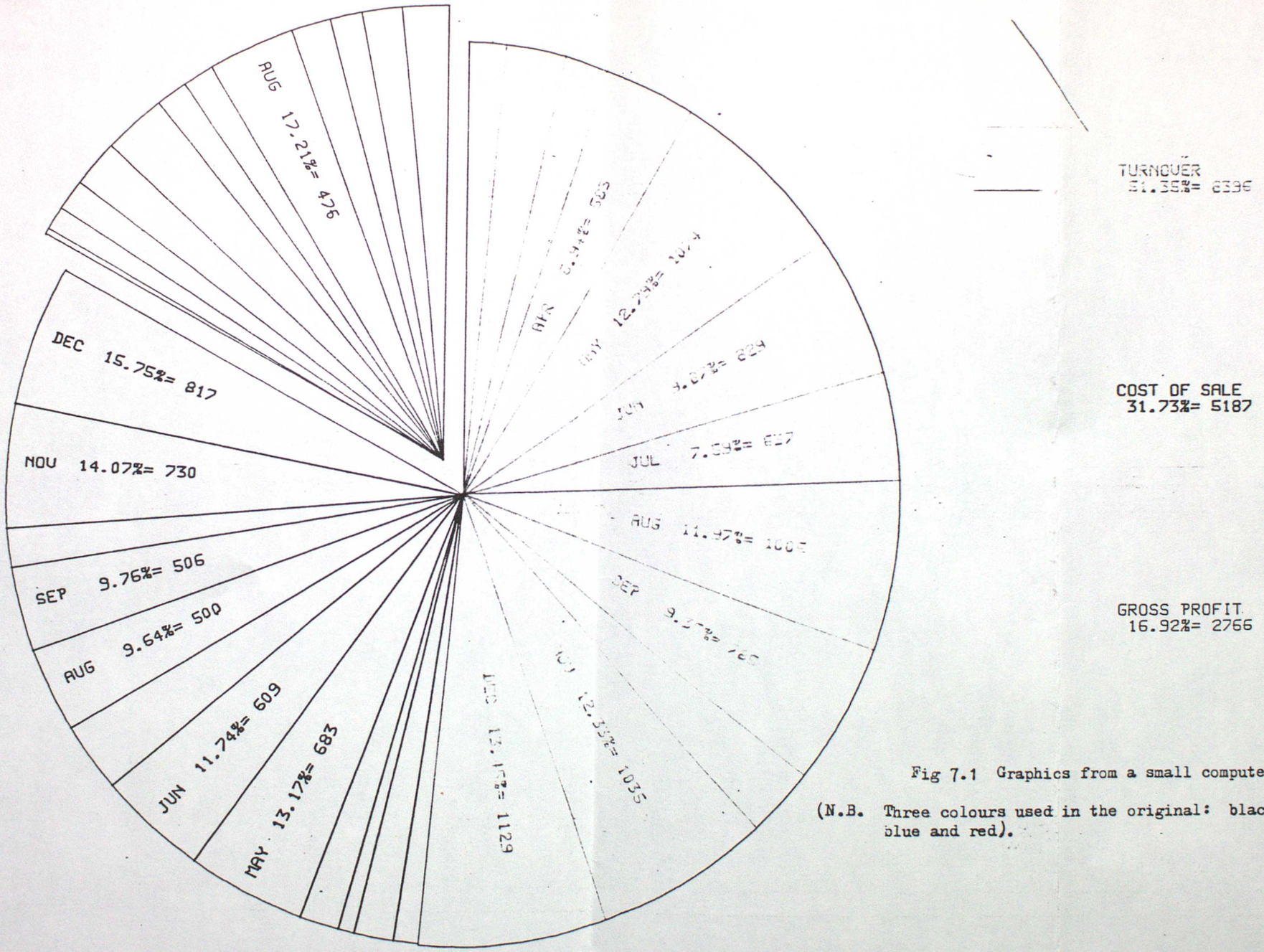
It is clear that Information Technology has many uses for 3b. Most of the changes suggested in this report - enquiry logging, statistical analyses, standard texts, graphical work, etc - would be greatly facilitated by the introduction of a small computer system dedicated to enquiry work.

Though there is concern for its social effects it would be wrong to take a 'Luddite' stand against IT. The widespread introduction of Information Technology seems inevitable because of the many advantages it offers.

The Meteorological Office has a good reputation for computing facilities for forecasting and other work involving 'number-crunching'. Information Technology has brought the application of computing to the processing of office work and the fast provision of information. The Met Office computing reputation in this arena should also be high, otherwise there will be a lost chance to improve revenue.

PIE CHART EXAMPLE

NIXDORF COMPUTER LTD



TURNOVER
31.35%= 8396

COST OF SALE
31.73%= 5187

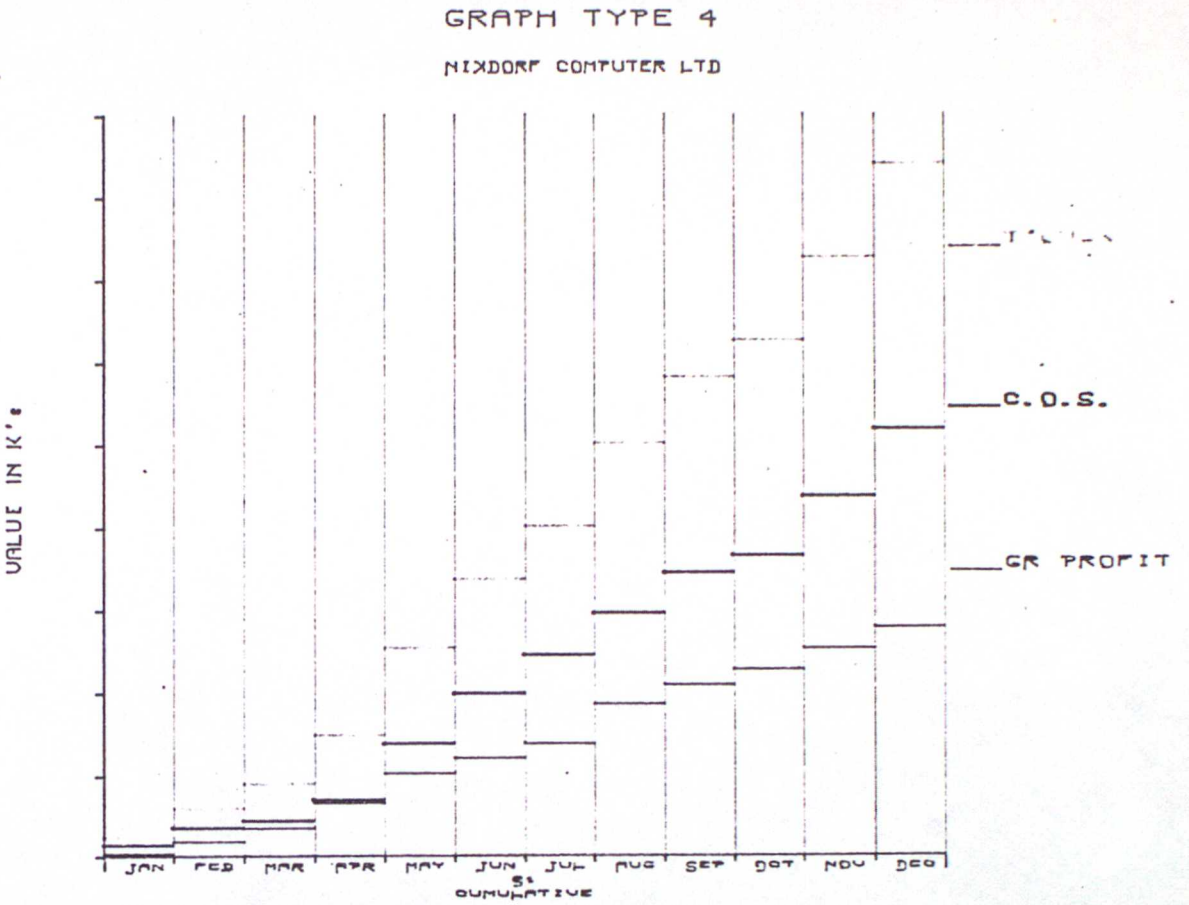
GROSS PROFIT
16.92%= 2766

Fig 7.1 Graphics from a small computer

(N.B. Three colours used in the original: black, blue and red).

100 % = 16349

Fig 7.2 Graphics from a small computer.
(N.B. Four colours used in original: black, blue, red and green)



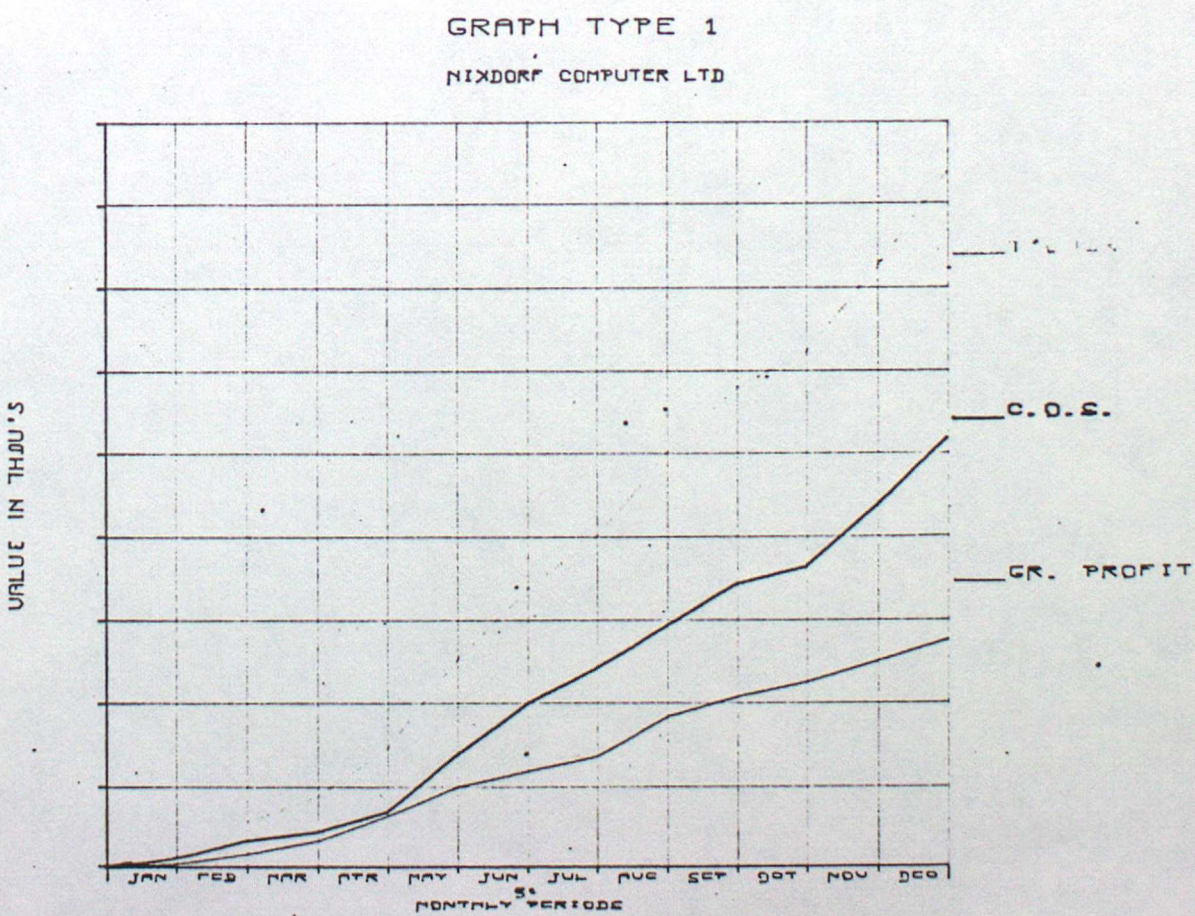


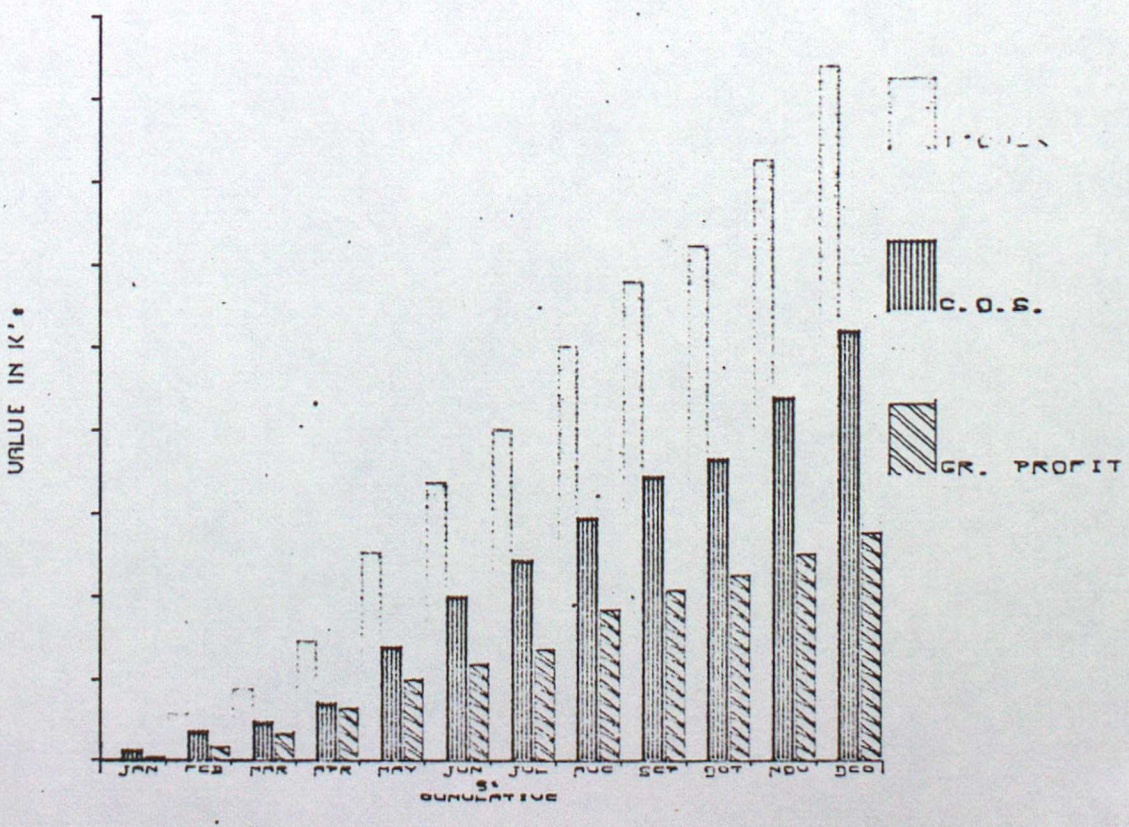
Fig 7.3 Graphics from a small computer.
(N.B. Three colours used in original: black, blue and red)

GRAPH TYPE 3

NIXDORF COMPUTER LTD

GRAPH TYPE 2

NIXDORF COMPUTER LTD



PICASSO'S PICASSOS

An exhibition from the Musee Picasso, Paris

Picasso's talent was prodigious. The drawing Bullfight was made just before his thirteenth birthday, the painting Girl with bare feet at the turn of his thirteenth and fourteenth years. The capacity to draw or paint after natrue was never a problem for him. He rarely doubted himself.

At the date of his second Parisian visits (1900 and 1901) Picasso was a confident individualist, committed to the exploration and assertion of himself through his art and drawn to the most private themes; but he was not altogether an optimist. His self-portrait of 1901 is more than a mere record of his appearance; his eyes and set mouth and the deep blues express a brooding state of mind.

This period in Picasso's life was soured by tragedy: in 1900 his friend CASAGEMAS, a victim of unrequited love, was driven to suicide. The death of CASAGEMAS of 1901 is a private expression of grief, but it accompanies and anticipates ambitious attempts to comment on sexual desire, love and death by means of allegory. One drawing is a study for such an allegorical picture, La vie. In the final painting a mother confronts the naked lovers accusingly. Picasso was to return often to this kind of suggestive allegory where we are left to interpret the meaning according to our own experience.

Picasso settled in Paris in 1904, and after meeting and beginning to live with Fernande Olivier his life became more buoyant. In the Self-portrait of 1906 his view of himself is less personalised and internalised. His head and features are here simplified and transformed in the image of primitive Iberian sculpture. Yet, here and in Seated nude, Nude with raised arms seen from behind and Nude with raised arms - works that relate to Les Demoiselle d'Avignon - his art remains self-centred, for he asserts himself through his capacity to transform and invent. In the latter two we see him re-inventing the human figure rather than merely depicting its appearance; he ruthlessly subjects the nude to his taste for the simple forms of archaic and primitive sculpture.

Fig 7.4 Right - Justification

In the first two paragraphs right - justification is not in use. It is in use in the third and fourth paragraphs to give lines that all finish in the same column. This text was held on disk, recalled, right - justification introduced to two paragraphs and hard-copy then obtained on an adjacent printer.

19 January 1982
12345

Christine Davies
1 Pembridge Crescent
London
W11 3DT

Dear Miss Davies

Thank you for sending us your cheque.

However, we are unable to process it for you because there was no signature.

We are therefore returning your cheque so that you can amend it or send us another as soon as possible.

Yours sincerely

CHRISTINE DAVIES
CUSTOMER SERVICES

Fig 7.5 Merging of files

Firstly the desired text was recalled from store. A question appeared on the screen to which the name and address was keyed in. Similarly, the reason for the return of the cheque was entered from the keyboard ('there was no signature'). Hard copy was then immediately produced.

A CENTRALISED ENQUIRY SERVICE

With regard to the Public Records Act, the Met Office has a duty to keep meteorological records and allow public access to them. There are at present several branches who handle public enquiries, these being: 1, 3, 7, 8, 9, 12, 13, 18 and 22. On a broader scale than each individual branch, there is no formalised method for enquiry handling. As there is now pressure on the Met Office to make greater use of it's data and skills to financial benefit, there should be a review of whether the present act of disseminating enquiries to various branches is the most efficient method of processing enquiries. The case for a combined enquiry service is now outlined.

8.1 The economies of scale

Certain changes in the set-up that produces replies to customer requests may not be feasible for 3b only. However, if the suggested changes in the support services and the like were dedicated to all enquiries, then the larger amount of work involved may further justify those changes. Some points are now raised, where having the larger number of enquiries or staff is important.

i. Typists and photocopiers

In chapter 4, it was put forward that due to the percentage of work in the typing pool provided by Met O 3, it may be best to bring the typists to the work. This argument is even stronger if all enquiry work is centralised. Similarly, for the introduction of photocopiers; the machines would be in use far more than if each enquiry section had a photocopier.

ii. Paperwork

If it is accepted that Met O 3b should have headed notepaper mentioning 'Climatological Enquiry Bureau', then it is logical that Met O 8c would have 'Hydrometeorological Enquiry Bureau' and so on. With one enquiry bureau there could be large runs of printed paper bearing just one heading.

As noted in chapter 2, each branch has developed it's own enquiry logging procedures. If one method were adopted, this would give economy in production and storage of log forms, and also universal comprehension of the system. By having uniform records of all enquiries, it would be possible to gain better statistical analysis of all enquiries received by the Office.

A parallel argument is used of course, for the international adoption of observing codes.

iii. Programming support

If all the people handling enquiries are brought together, then it is likely to be practical to have an 'enquiry programming team'. Where necessary they would develop programmes specific to enquiry needs, such as a general programme to tabulate data. However, they are more likely to be called upon to alter existing programmes to obtain the desired product. As they would need to know the suite of enquiry programmes well, then this is best achieved by being part of the enquiry service.

iv. Research

Again in chapter 4, greater research to find new applications of climatic data is advocated. If an industrial process was heavily dependent upon some combination of meteorological elements such that more than one branch is involved then, under the present system of enquiry handling, the full and proper application of climatological data may be inhibited.

If there was a research team attached to an enquiry service, in the manner of the programming team, they are likely to benefit from the broader approach to customer enquiries. Furthermore, applied research should be nourished by working in the atmosphere of a public services section.

v. Staffing

There will always be variations in demand for Met Office services. Under the current allocation of enquiries to branches, one branch may be suffering a peak whilst another is experiencing a trough in demand. By having a larger group of people, there would be a greater capacity to cope with such fluctuations.

Furthermore, there will be the opportunity for greater variety in enquiries handled by the staff. It should be possible to distribute the more interesting and less interesting tasks amongst the staff.

There may be a beneficial effect upon promotion. For a person who shows a flair for enquiry work or public relations there should be greater chances of promotion within a larger group. This, hopefully, would be an incentive.

vi. Information Technology

In chapter 7, word processors, computer graphics and other 'IT' is discussed and it's use advocated. Now, for 3b alone the cost compared to the work involved may not be cost effective. With a centralised enquiry service, the use of the computer and it's peripherals would be spread amongst a larger group of people and a larger workload. More intensive use of the equipment should result. All people working on enquiries would be able to share WP facilities for correspondence, graphics on VDU for presentations, hardcopy of graphics for sending to customers, shared programmes for office procedures and so on.

As there are many benefits to be gained from the introduction of IT to public service work, the higher degree of cost effectiveness of IT with a larger group may be a main factor in the creation of one public service section.

8.2 A Co-ordinated approach to Public Services

Examples have been given in chapter 2, of the diverse office procedures adopted by each branch for logging its enquiries. In chapter 4, examples of mis-directed enquiries were given. The inter-branch exploitation of Prestel was discussed in chapter 6. These are all ways in which an unco-ordinated approach to the public manifests itself. Ways in which a centralised public service section should render a more co-ordinated approach are now put forward.

i. Initial contact

If all letters and telephone calls asking for information were directed to one enquiry section, there is far less chance that a 'phone call will have to be transferred or a letter redirected. If specialist advice was needed then it would be the responsibility of the enquiry section to ensure the best service was provided; there would be no passing of responsibility from one enquiry section to another. The centralised enquiry section would be the clearing house, acting as agent to secure the specialist advice when needed from the appropriate branch.

ii. Financial considerations

By having all services within one pyramid of command, it should be easier to ensure that charges conform across the spectrum of services, to any current ruling.

With standard enquiry records, and so better statistics possible, greater financial control should come about. If there were to be any marketing exercise then all services can be considered rather than merely those within the confines of one branch, as is likely to occur at present.

iii. Promoting the Office

As noted elsewhere, visits to exhibitions should be planned with all possible Met Office services considered for display. Similarly, any promotional brochures or leaflets in any field, should cover all suitable Office services, not just those of the branch producing the leaflet, as at present.

The need for a presentation room for 3b and the possible sharing of that used by Met O 7, has been discussed in chapter 3. No such branch boundaries would need to be cross with one public service section. Again, a larger 'Public Services Section' should lead to more intensive use of facilities in a presentation room.

iv. Approach to Public Service Work

A more commercial approach to public service work is being taken up within the Met Office. This however is more apparent in some branches than others. Such discontinuities in commercial endeavour would be more easily removed within a unified services group.

Similarly with staff training for public contact work. It would be easier to prepare lectures when it is known that the same material is applicable to all attending.

Overall therefore, it would be easier to achieve a uniform attitude or approach to enquiry work when the people employed in revenue earning activities are within one section.

8.3 Conclusion

From a viewpoint within the Office, it may seem to make sense that some outside enquiries should go to one branch and some to another. The reason for this would seem historical, in that the responsibility for storing data was split amongst several branches. It was appropriate to send enquiries to the branch holding the appropriate data, as a lot of the data was in manuscript

form and bulky. Furthermore, even only ten years ago there were far fewer enquiries made than there are now.

The situation now is that the number of enquiries have grown markedly and a lot of data is, or can be, stored by computer compatible methods. Subject to economic limitations of distance, the data could be accessed from wherever desired given the appropriate equipment.

From a viewpoint without the Office, a customer has little concern for Met Office organisation, but does care how quickly and cheaply the information will be received. Apart from some small but active competition in forecasting, the Met Office has a monopoly on meteorological and climatological information. This though should not be an excuse for resistance to change. The proposal for a 'Centralised Enquiry Bureau' should be considered from the standpoint of the customer: will it give a better service?

9. CONCLUSION

This report on 3b has been written as a collection of proposals, which are open to discussion. Some of these proposals are for minor changes, but when viewed altogether, amount to a major overhaul of the methods of 3b. The overall view will now be considered.

The contents of chapters 2 to 8 can be split into two loose groups, with many suggestions being interdependent. Firstly, there is the reorganisation of working methods. Secondly, there is consideration of the manner of service given and a look at Electronic Office Equipment. The report will be reviewed in that manner.

In chapter 4 the working environment, together with activities supporting enquiry answering, were examined. It was suggested that changes in the surroundings should occur, in particular the provision of furniture and other office hardware to produce a more functional layout. Some may consider this ephemeral but a face-lift to 3b's environs would serve as a very useful signal of change, and as a visual disassociation from past ways. To ensure future preciseness, a manual of enquiry procedures was proposed.

In chapter 2, an alternative method of logging enquiries was proposed. There are simularities to the present system, but it is felt that the new system has several useful attributes. Firstly, the repetition of written data is reduced, as all necessary information is placed on one form, the 'Enquiry Log' form. The three other points of information recording serve to locate that form. Secondly, the 'Enquiry Log' form is an initial attempt to design a form suitable for the extraction of information for a computerised 3b enquiry database. Thirdly, with the logging routine suggested, the current state of any enquiry should be more readily known than with present methods.

The need for better management information (or 'process control' information in an industrial sense, where the process here is answering enquiries) has been noted in several places. At the moment, there is no record of which enquiries fell into the particular classes of the present classification and this allows no analysis of past enquiries by type. Furthermore, it was felt that for such a purpose the present classification was too coarse. In chapter 3, the proposed Enquiry Classification Code (ECC) was described. By a simple short coding, far more description of an enquiry can be achieved. Also, a Fortran programme was written to allow analysis of enquiries by profession, purpose or data requested. This has shown that it is possible to analyse the enquiries handled by 3b in some detail. (Further work would be needed before the method became operational).

In chapter 5, analyses were presented of numbers of enquiries in the past 5 years and of charges in 1981. The large percentage of legal enquiries was shown: there is some justification for the opinion that 3b's main role is as a supplier of information to the legal profession.

In examining the revenue data it must be remembered that the figures include an element of VAT in most cases. This confuses any analysis. However, the majority of charges fell into a narrow band, 80% falling within the figures of £11.50 to £25.30, with a medium of £17.25. Thus most 3b enquiries are low revenue earners. First of all, information about revenue needs to be more readily available. More importantly, the fact that the majority of enquiries only generates these quite small amounts (in a commercial sense) leads to questioning the cost of providing the information. The true cost should be thoroughly examined along with any methods to reduce costs.

Analysis shows that the number of telephone calls per month has been rising, but the number of charged enquiries per month falling, over the past 3 years. Care should be taken in drawing conclusions from this (the date could be predicted after which no charged enquiries would occur), but it does indicate a state of affairs that leaves no room for complacency.

From general observation, it is felt that with greater care, some enquiries could be developed into larger revenue earners than initial impressions reveal. (See the 'G Eve' example in chapter 6). However, any activities must be cost - effective for both the Met. Office and the customer. At present, when more detailed attention is required the senior members of staff handle the enquiry. Due to their higher capitation rates, the proposed 'nursing' of enquiries to higher revenue may then become financially unattractive to the customer. Where the greater experience or responsibility is not needed, the staff handling the more repetitive enquiries should be allowed to develop enquiries where they see fit. Consultation time with other staff is not revenue earning. Conversely, senior staff should be relieved of handling the easily answered enquiries to concentrate on management, development and consultancy work.

Apart from the financial reasons, it is more ethical to ensure that a member of the public is getting the best use of Met. Office information.

In chapter 6, an example was given of how a consultancy could be pursued (the G. Eve & Co letter). The benefits to the customer were emphasised and there was less emphasis on charges. This was an example where much higher revenue might have been earned. By careful scrutiny, some enquiries may earn, e.g., £40 instead of £20 simply by the customer agreeing to the provision of more information. Again, this will occur only by customers being shown the benefits to their work.

In chapters 6 to 8, consideration was given to matters beyond the internal organisation and present affairs of 3b.

Chapter 6 was concerned about 'image, impact and perception'. It was stressed that care must be undertaken to build an image of an efficient scientific organisation that has made an effort to send the best and most appropriate information.

Various low-key efforts to achieve this were suggested, including letter headed paper and covers. A most important move that should be made is to include graphical output (diagrams, maps, well laid-out tables, etc) because these are an aid to comprehension and also have greater impact.

After an exhibition visit, it became clear that Electronic Office Equipment ('Information Technology') had many benefits to offer Met. Office enquiry work. Though Word Processors are in the vanguard of these technological advances, it would appear that many aspects of the dissemmination of information will be radically altered by electronic equipment.

It is strongly recommended that a case is advanced for the acquisition of a small enquiry service dedicated computer, with Word Processing and graphics capabilities. The arguments for this are outlined in chapter 7. Also, so that the impact of such equipment is fully realised, it is suggested that management and staff of 3b alike visit appropriate exhibitions.

In chapter 4, the centralising of enquiry support activities was proposed ('vertical integration'). In chapter 8, these ideas were expanded and a single bureau to handle enquiries was recommended. The many advantages of this were outlined, but in particular it was pointed out that the general public are likely to benefit.

In general, the needs of the customer should be the driving force behind the activities of the enquiry bureau. So as to provide a better service, changes in internal organisation are needed. More information for management is needed to monitor efficiency and to allow analysis of finances and enquiries. Once the service has become more efficient, the analysis should lead to expansion of the enquiry service by marketing techniques.

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The following references are mentioned in the report or have been found to be useful background material.

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Frequency isopleth diagram: A new way of presenting wind observations. Weather, 1982, Vol 37, No 3, pp 80–81.

KW

Appendices

1.	Office forms.	The forms used for enquiry records in Met O 3b.
2.	Met O 3c.	A brief description.
3.	Met. Office Publications	A collection of Met. Office leaflets.
4.	Presentation Covers.	A few examples of covers used to enclose correspondence.
5.	Prestel directory.	A listing of Met. Office information available on Prestel and the page numbers.
6.	Office Equipment Index	A few advertisements from the pages of this magazine.
7.	XSEARCH.	A listing and explanation of programme MO3.ASRCELIB (XSEARCH) - designed to facilitate enquiry analysis based on the Enquiry Classification Code.
8.	BMDP output.	A3 sized output from BMDP statistical programmes, analysing 1981 3b charges.
9.	Information Technology	Leaflets and Brochures.

The above list of appendices is complete only in the master copy of the report, held by AD Met O(CS). In this subsidiary report appendices 3, 4 and 9 are absent. A listing of the programme XSEARCH is not given, though the remainder of appendix 7 is present. Only the more important diagrams of appendix 8 are present.

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APPENDIX ONE

The forms presently used in 3b for enquiry records.

1. The Charge Sheet (Fig A.1.1)

The columns to the left of the sheet are headed by letters referring to the current enquiry classification as listed in the centre. When an invoice is raised, the charge on that invoice is also placed in the appropriate column on this sheet. For example in April 1982 there was one agricultural enquiry and this was charged £11.50. All figures include V.A.T if applicable.

At top right is a record of the number of enquiries answered without charge, again by enquiry type. At right of centre is a table listing numbers of 'phone calls in the month. Both of these tables are compiled from individual records kept by each member of the enquiry bureau. At bottom right is a table summarising the data for numbers of enquiries.

2. The Inquiry Book (Figs A.1.2a and A.1.2b)

One line applies to each enquiry and enquiries are grouped by the date on which they were received, eg, 2nd October 1981 in the centre of Fig A.1.2a. Each column will now be considered.

In column 1 is a sequential number for each enquiry. At the beginning of each month the numbering is restarted at 1 with the first enquiry. In columns 2 and 3 the date on the letter is placed. In 4 and 5 comments about re-routed mail are made. In column 6 the name of the customer is noted and the information required noted in column 7. All this information on the left-hand page, ie. in Fig A.1.2a is recorded at the time of arrival of the mail.

On the right-hand page of the book (Fig A.1.2b), under the general heading 'Details of Reply', information is recorded at the time of completion of the reply. From left to right this is (where appropriate): the file number where the correspondence is kept, the date at which the correspondence was sent, the invoice number and any charge made (inclusive of V.A.T if applicable).

In column 12, the letters represent the type of enquiry according to the classification found on the charge sheet (eg B is for Building). Finally the last column is initialised by the person who handled the enquiry.

3. The Invoice Book (Fig A.1.3)

Each A4 page is ruled into two sets of four columns. Firstly, in numerical order, the Invoice number is written. This is followed in column two by the file number, giving the location of the relevant correspondence. In the third column the date at which that invoice number was used is noted, followed by the initials of the person who answered the enquiry.

4. Customer Index cards (Fig A.1.4)

Cards are kept with the customers name as the index. Two such cards are shown in Fig A.1.4.

At the top of the page is a general card for customer names beginning with the initial letter 'C'. Below is a card for a specific customer who has been found to request data frequently enough to warrant a card listing the enquiries from that customer only.

On the left-hand side of each card is the date at which the enquiry was dealt with, followed by the customer's name (top card only) and the data given. The file in which the correspondence has been placed, is noted on the right-hand side.

CHARGED

A	B	C	H	L	L	L	L	M	P	R	S	T	Y	Z
11-50 (1)	21.43 13 68 14-95 23-00 25.28 17.33 51-75 20-70 14 95 17 60 18.40 74.75 13 55 16.84 24-15 14-49 27.69 34.50 20.13 22.14 19 55 20.13 48.32 11-50 20.70 11-50 14-95 21 27 16-10 11-50 11-50 24-15 23.00 13-80 11-50 25-30 23-00 11.50 23-00 28.75 23-00 25.32 23.00 952 14 (43)	28.83 74-75 83-95 21.28 27.68 25.32 11-50 40.25 20.70 20.13 11.50 23.00 14.38 11.50 11.50 2070 442/95 (16)	13-80 17.25 85.50 115-00 226 (9)	11.61 17.33 20.24 16 10 14-49 13 68 18 40 22-77 16-56 22-77 15-64 20-70 17-25 126-50 16 10 17-25 14-95 14-26 14-95 13-80 16 10 13.13 20 12 19 55 13 27 20 70 13-11 14-95 20 70 21 85 24-38 20-24 22-54 20-70 20-93 22-08 21-16 21-39 20-43 16 10 13 27 18 40 21 37 1897 18-40 18-64 18-40 17 25 17 25 15-75 18 40	26.45 18 40 20-93 20-43 21-16 16-79 25-07 17-71 15-64 1610 16-33 14-95 18-63 1897 24 72 26-45 19-78 23-23 22-31 16-70 23-46 1265 1782 18-40 1380 13-57 21-16 30-36 22-54 21 27 15 27 1897 16-10 14-95 16-70 1955 16 10 21 27 16 10 25 30 344-11 15 52 12-30 22-08 23-23 23-23 17-68 23-00 20-93 21-62	22-77 18.40 18-86 2300 2070 18.40 18.40 18.40 13-74 15-87 15-64 18.40 11.50 11.62 16-10 2300 20.70 13.00 16.67 15.23 13.80 23.00 20.70 18-63 21.27 21-39 21-62 20-01 21-16 20-93 17-25 21.85 11.62 11.50 21-62 21-62 21-39 13.20 16.10 19-78 21-39 20-47 22-08 17-02 21-16 17-02 18.40 18.40 16-10 18.40	14-95 18-40 14-26 16-33 11-50			4228-55 34-50 1140-80 14-95 11.96 5430/76 (9)		12.84 17-25 31/09 (9)	37.38 33.31 5.25 17.25 93.23 (9)	11-50 (1)
B	E	I												
	14.38 (1)	11-50 (1)												

1012/34
1299/14
917/47
75/43
3306/39 (11)

AMOUNT £

A - Agriculture, (Farming, Forestry, Market Gardening)

B - Building & Design (inc Siting)

C - Commerce (Sales, Marketing, Advertising)

E - Education Literary

H - Heating and Ventilation

I - Industrial and Manufacturing

L - Legal (Damage, Accident, Insurance)

M - Medical & Health (inc. where to live)

P - Press and Information Centres

R - Research

S - Sport, Hobbies, Holidays

T - Transport & Communications

Y - Miscellaneous (Purpose known)

Z - Miscellaneous (Purpose unknown)

11 50
958 14
442 95
14 38
226 55
11 50
3306 39
5430 76
31 09
93 23
11 50
10537 99

APRIL 1982

	A	B	C	E	H	I	L	M	P	R	S	T	Y	Z
	1	11	16	141	1	1	11			1			1 11	11
FREE	1	7	2	18	1	6	7			6			21	7	76
	6	5	2	11	3	3	33	7		6		2	21	15	114
	2	5	7	4	6	1	25	4	3	7	1		53	48	166
	3	7	5	3		3	7		1	8	2	1	9	8	57
	2	17	30	3	1	8	18			2		3	15	26	125
	5	18	6	7	3	7	21		2	8	1	2	28	25	133
PHONE	18	52	50	28	13	22	104	11	6	31	4	8	126	122	595

Free	1	7	2	18	1	6	7			6			21	7	76
Charged	1	43	16	1	4	1	156			5		2	4	1	234
TOTAL	2	50	18	19	5	7	163			11		2	25	8	310
PHONE	18	52	50	28	13	22	104	11	6	31	4	8	126	122	595
TOTAL	20	102	68	47	18	29	267	11	6	42	4	10	151	130	905

Fig A.1.1. The Charge sheet.

1 Serial No.	Month / Year — Receipt: 2 Date/Time	3 Method	Reply: 4 Date/Time	5 Method	Details of Inquiry Fig A.1.2a. The Enquiry Book. 6 Inquirer	7 Information required	8 Init. of sender	9 Init. of receiver	10 whether read back
8	29	Sept			K. Dryden	Wx Teesside			
9	26	"			Miss J.S. Martin	Rainfall & Temps Afon Gamlan			
10	29	"			Bullen & Parts	Wx Cheam 1960			
11	30	"			P. Kennedy	Data for Bournemouth			
12	30	"			Derek Crouch.	Wx Grimsby			
13	30	"			Hammond Adj	Wx Canterbury 20 Aug 1981			
14	30	"			Hammond Adj	Wx Wimbledon 31 July 1981			
15	28	"			Evill - Coleman	Wx Wakefield 6 Nov 1980			
16	29	"			Dept of Environment	EEC Ecological Survey.			
17	29	"			Sp. Sharrett	Climate Isle of Hern			
18	28	"			C.U. Assurance	Wx B'ham 3 May 1981			
19	24	"			TRRL	Trafs Moment Wood 79 & 80			
					2 OCTOBER 1981				
20	29	"			Tedstone George-Dee	Wx W'hasta Nov 1979			
21	1	Oct			Norman Fryzell	Stormdamage Bromley 1 Aug 1981			
22	29	Sept.	Via LWC		D.G. Lane	Wx Mortford Appt for Parachutery.			
23	25	"			John Ryle	Rain & Cloud U.K Aug 79.			
24.	30	"			Sharon Powell	Climate data Cork Lowell			
25	30	"			United Glass Containers	Daily data 5 Stations 1976 →			
26	14	"	Via 7a.		M.N. Pickup	Data for Ringway.			
27	23	"	Via B. Down		MOD. Ch Cam.	Wx Boscombe Dam Sept 81.			
28	30	"			Redland Bricks	Wet freq Gatwick.			
29	1	Oct			Machinists	Wx Cardiff Dunstable. Dec 78/March 79			
30									
					6 October 1981.				
31	1	Oct			Miss A. Payne	Data for Portsmouth			
32	29	Sept	Via Bawtry		Health & Safety	Winds Finningley			
33	28	"			UKAEA Dounreay	Copy of tape			
34	1	Oct			Tarmac	Wx Tettenhall			
35	29	Sept			Wimpey Labs.	Temps Hayes.			
36	30	Sept	Via Bawtry		Metro	Snow Halifax			
37	2	Oct			Young Austen & Young	Wx Accrington			
38	2	Oct			Ellis & Buckle	Wx Stowns			
39	2	"			R.P. Megilley	Wx Chiltern Hills			
40	30	Sept.			Sue Cooper	Rainfall Penmon			
41	28	"			Sgt Horsburgh	Climate data Otterburn.			
42	2	Oct			Howell & Brook	Stormdamage 19/20 Sept Corby.			
43	2	"			C. Brockle Hurst	Wx Worcestershire 19/20 Aug 1981			
44	2	"			T. Howell Self	Wx Cambridge - Warwick Nov 1980			
45	30	Sept.			C.U. Assur.	Wx Scunthorpe 20 May 81.			

Details of Reply				12 Type of Inquiry		13 Information supplied by
Information supplied	Fig A.1.2b. The Enquiry Book (right-hand page).					
1/5/113D	14-10-81	7183	20-70		B	DW
1/5/105B	23.10.81	7192	20-70		B	
1/4/119E	16.10.81	7037	16-33		C	
1/4/119F	13.10.81	7032	16-22		C	
1/4/23C	13.10.81	7027	19-28		C	
1/4/13C	9.10.81	6982	16.10		C	
1/4/116E	20.10.81	7154	17-25		C	
1/4/102D	20.10.81	7162	14-95		C	
1/5/127B	8-10-81	—	—		Y	RW
1/5/113D	~~05~~-10-81	7034	13-80		C	DW
1/1/11	22-10-81	7179	14-95		C	DW
1/5/36B	19-10-81	7172	17-25		B	DW
1/5/39	19-10-81	7161	17-25		B	DW
1/4/105B	19-10-81	7163	17-25		C	DW
1/5/128	15.10.81	7193	6.90		W	RW
1/4/22E	26-10-81	7201	23-00		C	DW
Passed to Mrt 08					C	
1/4/31D	28.10.81	7226	9.70		C	RW
1/4/108.	19.10.81	7166	14.95		C	
1/4/23E	13.10.81	7073	16.35		C	
1/4/13C	16.10.81	7140	16.35		C	

Fig A.1.3. The Invoice Book.

5192	1/4/107F	8-4-81	RW
5193	1/4/64D	"	DMP
5194	1/4/83	"	
5195	1/4/79	"	
5196	1/4/107F	"	RW
5197	1/4/66C	"	
5198	1/5/120C	"	DMP
5199	1/4/118F	"	
5200	1/4/77B	"	
5201	1/5/1	"	RW
5202	3/4/1C	"	
5203	3/5/15	"	
5204	3/5/2	"	
5205	3/5/76	"	
5206	1/4/33D	"	
5207	1/4/31C	"	
5208	1/4/66	9-4-81	RW
5209	1/5/124	"	
5210	1/4/33E	"	
5211	1/4/55	"	
5212	1/4/2C	"	DMP
5213	1/7/13C	"	
5214	1/4/103F	"	
5215	1/4/79	"	
5216	1/4/116D	"	
5217	1/4/44B	"	
5218	1/4/16C	"	
5219	1/4/116D	"	
5220	3/4/1C	"	
5221	1/5/112C	10-4-81	RW
5222	1/4/110F	13-4-81	RW
5223	1/5/128	"	RW
5224	2/5/121	"	
5225	1/2/7B	"	
5226	1/4/118F	"	
5227	1/4/127	"	
5228	1/4/3	"	
5229	1/4/119E	"	
5230	1/6/18D	"	RW
5231	1/4/100F	"	
5232	3/4/1C	"	
5233	1/4/128	"	
5234	1/4/65C	"	
5235	1/5/124	"	RW
5236	1/7/16	14-4-81	RW
5237	1/6/13	"	Pb
5238	1/5/128	14-4-81	RW
5239	1/4/1	"	
5240	Routine	"	
5308	files		
5309	1/4/100F	"	
5310	Routine	"	
5317	files		
5318	1/5/128	"	RW
5319	1/2/8	15-4-81	
5320	1/6/13D	"	
5321	1/2/2C	"	
5322	2/5/117	"	
5323	1/5/21	"	
5324	1/5/24	"	
5325	1/5/128	"	RW
5326	Routine	"	
5345	files		
5346	1/4/102D	"	
5347	1/5/128	"	RW
5348	1/4/122B	"	
5349	1/4/122B	"	
5350	1/4/123B	"	
5351	3/5/75	"	
5352	3/5/36	"	
5353	1/7/16	"	RW
5354	3/5/28	"	
5355	1/4/128	"	
5356	1/4/124B	"	
5357	1/5/112C	"	RW
5358	1/4/103F	"	
5359	1/4/64E	"	
5360	1/4/104D	"	
5361	1/4/103F	"	
5362	1/4/101D	16-4-81	
5363	1/4/64D	"	RW
5364	1/4/127B	"	
5365	1/4/116D	"	
5366	1/5/105B	21-4-81	
5367	1/4/119E	"	
5368	1/4/127B	"	
5369	1/4/102D	"	
5370	1/4/111F	"	
5371	1/4/126B	"	
5372	1/4/64E	"	
5373	1/5/124	"	
5374	1/4/116D	"	RW

C Misc

11.2.82	Clarke Willmott - Clarke Wx Exeter 20/22 January 1979	1/4/118G
17.2.82	R.G. Carter Wx Wolcum Dec 1978	1/5/103C
13.2.82	Cofleys Wx Wyton 17/19 Dec 1981	1/4/119F
18.2.82	Chatterton & Millington: Temp. Tennyton Dec/Jan 1977/78	1/4/119F
17.2.82	Clayton Wx Gamsby Oct 81/Jan 82	1/5/124
15.2.82	Clarke Willmott & Clarke Wx Taunton 7/8 October 1981	1/4/111C
26.2.82	R.G. Carter Monthly data Wolcum Oct 80 - Oct 81	1/5/124
5.3.82	Cater Choat Partnership. Temps Jan 82	1/4/127B
4.3.82	T.I. Clough Wx Cumbria - W. Tarb April 81	1/4/119F
8.2.82	M. Collins - Wind information UK.	1/7/14B.
9.3.82	Cole - Cole Wx Oxford 27/28 Oct 1981	1/4/120D
10.3.82	Conder. N. Ltd. Wx Blackpool Aug.-Feb 77-82	1/5/128C
23.2.82	WE Cox & Co Ltd Wx Dover 6/12 December 1980	1/4/128C
8.2.82	A.L. Cooper Wind frequencies Bude	1/4/128C
12.3.82	Chorsley Hessian Wx LAP 14 January 1982	1/4/130
25/2/82	Cedar Court Hotel (J.W. Brown) Winds Camberley area 19/20 Sept 1981	1/4/124B.
17/2/82	F. Capener - Wx records Aylesbury Dec 1980 - Feb 1982	1/5/122

CREMER & WARNER 1/5/41

15-8-78	Data for Plymouth, Princetown, North Hessary Tor and Tavistock	"
—	Data for Plymouth area.	"
31.8.78	Wind & rainfall data for Plymouth etc.	"
26.1.79	Data for N. Hessary Tor, Rowborough Airport and Mountbatten	"
24-8-79	Plots of Cardington Balthum data by Cardington (on file 1/5/113B)	~~[illegible]~~
2/6/80	Data for Gardeston & Lowestoft	"
14.7.80	Winds Birmingham 1979/80	"
12.11.80	CMs 51A & 75	
12-5-81	Data Stanford-le-Hope & Shoeburyness	— " —
27-7-81	Data Marston	— " —
13.5.82	Wind Data Westbury	

Fig A.1.4. Customer card index.

APPENDIX 2. MET O 3C - MARINE CLIMATOLOGY

Met O 3c is the Marine Climatology section of Met O 3 and is found at the Eastern Road annexe, approximately one-half mile from the rest of Met O 3. This location causes 3c to effectively work as a self-contained group.

In charge of 3c is Mr R Shearman (PSO). His staff are broadly organised into 'Computing' and 'Enquiry' sections. For those involved in research or programme development, it is intended that there should be a strong awareness of the need for applications to enquiry answering but that the time pressure present in enquiry work should not be present.

Enquiries

In figs A.2.1. and A.2.2., are the front and reverse of the 'job sheet' used by 3c. Once an enquiry is made then a job sheet is initiated and this serves as the record of the enquiry. As can be seen all pertinent data is recorded.

Frequently the initial enquiry is by telex and this is treated with as much respect as a letter. Much of 3c's work is from the oil industry and telex is symptomatic of their 'results yesterday' attitude. 3c to maintain custom must attempt to work to the same pace.

If the initial enquiry is by phone then the customer is questioned to ascertain the purpose of the enquiry and how best it can be answered. Once this is established (however the enquiry was made) a firm quote is given. A scale of costs for standard computer programmes has been prepared as an aid in forming quotes. The scale of changes attempts to cover typists time, development cost, etc., as well as the actual computing cost.

Computing

Most data used by 3c is held on the COSMOS computing system. Recent data needs to be handled manually if needed for an enquiry.

As noted in the telexes, the customers of 3c tend to want answers quickly. The computer 'unit allocation' can cause problems if there are not enough day-time priority units left; the job then has to be run overnight.

A 'Research Industries' mini-computer arrived early in 1982. It is planned to hold the most often used data in tabulated frequency form for use on the 'mini', to help overcome the computer units problem. The justification for 3c's purchase was however, for use at exhibitions, where visitors are used to seeing high-technology displays. At a recent Aberdeen exhibition a TSO link via telephone was tried but 40% down-time was experienced.

Two monitors can be connected to the 'mini', allowing one to be used for control and display, the other for display only. Colour or black and white monitors can be connected.

The mini-computer has several useful facilities making it very useful beyond the role of exhibition work. A Word Processing package will allow bills to be drawn up, possibly merging with an address file. The use of standard letters, e.g. for yachtsman's enquiries, are envisaged. Standard reference lists for customers are also planned. A catalogue of available data will be kept more easily on computer. Further housekeeping uses are planned. In addition to 'WP', the purchased mini-computer has graphics and printing facilities which should prove very useful in improving enquiry response.

Fig A.2.1 Front of 3c enquiry log form.

1. INITIAL CONTACT by telex/letter/phone received by date

2. NAME
ADDRESS

confirmation requested yes/no
confirmation received
letter/telex
customers reference

3. ANALYSIS REQUIRED

Type Area or station Date required Price quoted

Reason for analysis

4. INFORMATION GIVEN BY PHONE/LETTER

Comments
Follow up
Letter written on Returned from typists dispatched

5. COMPUTER ANALYSIS yes/no (see over for details)
Comments

dataset
computer account
priority
total units

Passed to on returned to on

6. OTHER ANALYSIS

Passed to on returned to on

7. DATA CHECKED by on dispatched without letter/account on
Letter written on Returned from typists on
Account written on Returned from typists on Total cost
Dispatched on data/letter/account/other enclosures
Comments

8. JOB NUMBER ACCOUNT NUMBER FILE

Fig A.2.2 Rear of 3c enquiry log form.

DETAILS OF COMPUTER ANALYSIS number of programs

Program type

Program name

Dataset

Submitted

Via

Using

Output Expected

Returned

Run/Fail

Units

Appendix 5

Meteorological Office Prestel directory

(May 1982)

Page numbers referring to Met Office Services are listed on page one. Climatic information is included in the sections 'Average UK Weather' and 'Holiday Weather', at the rear of the directory.

METEOROLOGICAL OFFICE

INFORMATION

ON

PRESTEL

METEOROLOGICAL OFFICE (MET O 7a)
LONDON ROAD
BRACKNELL
BERKS RG12 2SZ
TEL: 0344-20242 ext 2356
APRIL 1982

FOR ALL METEOROLOGICAL INFORMATION INCLUDING WEATHER FORECASTS, REPORTS OF ACTUAL WEATHER CONDITIONS & WEATHER STATISTICS :- KEY 209 FOR MAIN INDEX PAGE

OR FOR :-

	KEY
INFORMATION ABOUT THE METEOROLOGICAL OFFICE & THE SERVICES IT PROVIDES	2090
FORECASTS FOR LAND AREAS	2091
FORECASTS FOR SHIPPING AND SAILING	2093
ACTUAL WEATHER IN UK	20940
ACTUAL WEATHER WORLD-WIDE	2094
FORECASTS FOR GENERAL AVIATION	20971
EUROPEAN FORECASTS	20915
LONG PERIOD WEATHER AVERAGES	2096

Services Provided by the Meteorological Office — 20901

Introduction to Meteorological Office	209 010
Routine Services	209 011
Special Services (also see below)	209 012
Contact points for services and advice	209 03
The National Meteorological Library	209 014
Services to Agriculture	209 05
Services to the Construction Industry	209 061
Services to the Off-Shore Industry	209 062
Ship Routeing Service	209 063

Meteorological Office on Prestel — 20909

Brief description of the Met. Office information on Prestel	209 093
Tour of Met Office pages	209 098
'Whats New' on Met. Office pages	209 091
Response frame for Met. Office Directory	209 090
Weather for Travel Index	209 07
European Weather Index	209 15
Index for Weather in UK regions	209 12

FORECASTS FOR LAND AREAS

UK FORECASTS

	Updated	Frame Charge	Page
Caption Chart, for 24 hours	4 times/day	3p	209 11
Text, for 24 hours	4 times/day	3p	209 10
3 day outlook	once a day	6p	209 13
7 day outlook (issued Sun available until mid week)		10p	209 14 a & b
Regional Forecasts	3 or 4 times/day	4p	
Scotland & Northern Ireland			(209 123)
Glasgow, Edinburgh & Dundee areas			209 1230
Aberdeen and Grampian area			209 1231
Northern Ireland			209 1235
East and North East England			(209 124)
Lincolnshire & Humberside			209 1240
N E England			209 1242
North West England & N Wales			(209 125)
North West England			209 1250
Lake District including Cumbria	2 times/day		209 175
Snowdonia	2 times/day		209 178
Midlands			(209 126)
East Midlands (Northants, Leicester, Notts & S Derby)			209 1261
S & W Yorkshire & N Derbyshire			209 1262
West Midlands & Warwickshire			209 121
S W Midlands (Hereford and Worcs and Gloucester)			209 1272
Staffordshire and Shropshire			209 1251
S W England and S Wales			(209 127)
Somerset and Avon			209 1271
South Wales			209 1273
Devon and Cornwall			209 1274
East Anglia			(209 128)
Norfolk, Suffolk and Cambridgeshire			209 122
Hertfordshire, Bedfordshire and Essex			209 1291
South East and Central Southern England			(209 129)
London & S E England			209 120
Central Southern England (Wiltshire, Hampshire & Dorset)			209 1292
Oxfordshire, Berkshire & Buckinghamshire			209 1293
Holiday Area Forecasts (available Apr to Sep	updated 2 times/day	4p	
The coast of Essex, Kent and Sussex			209 171
Anglesey and coast of North Wales			209 173
The coast of S Wales			209 177
West coast of Scotland (including the Trossachs and Loch Lomond)			209 179

Available throughout the year -

Lake District	209 175
Snowdonia	209 178

Skiing Forecast - winter only

Forecast for Scottish Ski Resorts	once a day	4p	209 16
Forecasts for Special Events			209 19
eg. Wimbledon, Golf Championships, Test Matches. etc			
Motorway Forecasts			209 18
M4 Bristol - London		5p	209 180
Warnings of bad weather on roads			209 189
EUROPEAN FORECASTS			209 15

A short forecast of weather and maximum temperature for a selection of European Cities. Updated Daily.

FORECASTS FOR SHIPPING & SAILING

SHIPPING FORECAST:	4p per frame	
Synopsis	4 time/day	209300
Viking, Forties, Cromary & Forth		209301
Tyne, Dogger, Fisher & German Bight		209302
Humber, Thames, Dover & Wight		209303
Portland, Plymouth, Biscay & Finisterre		209304
Sole, Lundy, Fastnet & Irish Sea		209305
Shannon, Rockall, Malin & Hebrides		209306
Bailey, Fair Isle, Faeroes & SE Iceland		209307
GALE WARNINGS sincelatest Shipping Forecast	As required	209308
complete gale warning summary	As required	20931
SEA CROSSINGS: Southern North Sea	3 time/day	209330
Strait of Dover		209331
English Channel (East)		209332
St Georges Channel		209333
Irish Sea		209334

FORECASTS FOR GENERAL AVIATION 209 71

AREA FORECASTS

Midlands 5200N - 5300N, 0030W - 0245W	209711
Luton Airport & 30 nm radius	209714
Rye-Berck-Ambleteuse-Ostend-Folkestone-Rye	209715

ROUTE FORECASTS

Fairoaks-Headcorn-Lydd-Shoreham-Arundel-Haslemere-Guildford-Fairoaks	209717

TAFS

Birmingham, Coventry & E Midlands	209719
Exeter, Jersey & Southend	209710
Hurn, Southampton & Staverton	209716
Le Touquet, Ostend & Rotterdam	209718

REPORTS OF CURRENT WEATHER CONDITIONS — 3p per frame

UK REPORTS - updated every 3 hrs — 20940

Southern England & E. Anglia	209400
Central & Northern England	209401
S W England & Wales	209402
Scotland & N Ireland	209403

REPORTS FROM ABROAD - for the last 24 hrs updated every 6 hrs — 2094

Austria	209426	Italy	209426
Azores	209424	Luxembourg	209425
Belgium	209425	Madeira Is	209424
Bulgaria	209428	Majorca	209424
Canada	209414	Malta	209426
Canary Islands	209424	Minorca	209424
Channel Islands	209421	Morocco	209424
Corsica	209422	Netherlands	209425
Cyprus	209428	Norway	209427
Czechoslovakia	209428	Poland	209427
Denmark	209427	Portugal	209423
Finland	209427	Romania	209428
France	209422	Sardinia	209426
Germany East	209427	Sicily	209426
Germany West	209425	Spain	209423
Gibraltar	209423	Sweden	209427
Greece & Islands	209428	Switzerland	209425
Hungary	209428	Tunisia	209426
Ibiza	209424	U.S.A.	209414
Iceland	209427	U.S.S.R.	209427
Ireland	209421	Yugoslavia	209428

SKI-ING REPORTS - winter only (Usually Oct-Apr) updated daily — 4p

Ski-ing conditions at Cairngorm & Lecht	209470
Ski-ing conditions at Glenshee & Glencoe	209471

YESTERDAY'S WEATHER

Daily extreme values of temperature, rain & sun	3p	209452
Features of interest (When applicable)	2p	209451

AVERAGE UK WEATHER

A description of average UK weather conditions, by season and by month.

4p a frame

	Page	
WINTER		
Winter temperature	2096200	
Winter rain, snow, fog & sunshine	2096201	
Average December weather	2096202	
" January "	2096203	
" February "	2096204	
Noteworthy December weather events in past years	2096205	a & b
" January " " " " "	2096206	a & b
" February " " " " "	2096207	a & b
SPRING	Page	
Spring temperature	2096210	
Spring rain, thunder, snow & sunshine	2096211	
Average March weather	2096212	
" April "	2096213	
" May "	2096214	
Noteworthy March weather events in past years	2096215	a & b
" April " " " " "	2096216	a & b
" May " " " " "	2096217	a & b
SUMMER	Page	
Summer temperature	2096220	
Summer rain, thunder & sunshine	2096221	
Average June weather	2096222	a & b
" July "	2096223	
" August "	2096224	
Noteworthy June weather events in past years	2096225	a & b
" July " " " " "	2096226	a,b & c
" August " " " " "	2096227	a & b
AUTUMN	Page	
Autumn temperature	2096230	
Autumn rain, snow & fog	2096231	
Average September weather	2096232	
" October "	2096233	
" November "	2096234	
Noteworthy September weather events in past years	2096235	a & b
" October " " " " "	2096236	a & b
" November " " " " "	2096237	a & b

Monthly values of temperature, rainfall and sunshine for England and Wales, Scotland & Ireland for the last few years 20951

M

HOLIDAY WEATHER

for resorts in and around Europe

he resorts are grouped alphabetically (see below) and average values of daily sunshine, maximum emperature & number of dry days are given for each month. frame charge 4p

ROUP 'A'	AUSTRIA-Innsbruck,Salzburg,Vienna AZORES-Ponta Delgada BELGIUM-Brussels BULGARIA-Sofia,Varna CANARY IS-Tenerife CORSICA-Ajaccio
ROUP 'C'	GIBRALTAR GREECE-Athens GREEK IS-Corfu,Crete,Rhodes ITALY-Florence,Genoa,Naples, Rimini,Rome,Venice
ROUP 'E'	PORTUGAL-Faro,Lisbon,Oporto SARDINIA-Cagliari SICILY-Catania SPAIN-Alicante,Barcelona,Madrid, Malaga,Tortosa,Valencia
GROUP 'B'	CYPRUS-Nicosia DENMARK-Copenhagen FRANCE-Biarritz,Bordeaux,Brest,Nantes, Nice,Paris GERMANY-Berlin,Freiburg,Hamburg
GROUP 'D'	LUXEMBOURG MADEIRA-Funchal MAJORCA-Palma MALTA-Valetta NETHERLANDS-Amsterdam NORWAY-Bergen,Oslo,Trondheim
GROUP 'F'	SWEDEN-Stockholm SWITZERLAND-Geneva,Lugano TURKEY-Istanbul YUGOSLAVIA-Belgrade,Dubrovnik,Split, Zagreb

	SPRING & SUMMER		AUTUMN & WINTER	
	Month	Page	Month	Page
ROUP 'A'	Mar	20961000	Sep	20961100
	Apr	20961010	Oct	20961110
	May	20961020	Nov	20961120
	Jun	20961030	Dec	20961130
	Jul	20961040	Jan	20961140
	Aug	20961050	Feb	20961150
ROUP 'C'	Mar	20961002	Sep	20961102
	Apr	20961012	Oct	20961112
	May	20961022	Nov	20961122
	Jun	20961032	Dec	20961132
	Jul	20961042	Jan	20961142
	Aug	20961052	Feb	20961152
ROUP 'E'	Mar	20961004	Sep	20961104
	Apr	20961014	Oct	20961114
	May	20961024	Nov	20961124
	Jun	20961034	Dec	20961134
	Jul	20961044	Jan	20961144
	Aug	20961054	Feb	20961154

	SPRING & SUMMER		AUTUMN & WINTER	
	Month	Page	Month	Page
GROUP 'B'	Mar	20961001	Sep	20961101
	Apr	20961011	Oct	20961111
	May	20961021	Nov	20961121
	Jun	20961031	Dec	20961131
	Jul	20961041	Jan	20961141
	Aug	20961051	Feb	20961151
GROUP 'D'	Mar	20961003	Sep	20961103
	Apr	20961013	Oct	20961113
	May	20961023	Nov	20961123
	Jun	20961033	Dec	20961133
	Jul	20961043	Jan	20961143
	Aug	20961053	Feb	20961153
GROUP 'F'	Mar	20961005	Sep	20961105
	Apr	20961015	Oct	20961115
	May	20961025	Nov	20961125
	Jun	20961035	Dec	20961135
	Jul	20961045	Jan	20961145
	Aug	20961055	Feb	20961155

P.T.O FOR MORE STATISTICS

AH

MONTHLY & ANNUAL AVERAGES OF TEMPERATURE, RAINFALL & SUNSHINE

BRITISH ISLES

England(S)

Cambridge	20960100
Clacton	20960101
Cromer	20960102
Exeter	20960103
Kew	20960104
Newquay	20960105
Oxford	20960106
St.Helier	20960107
Southampton	20960108
Worthing	20960109

England(N)

Ambleside	20960110
Birmingham	20960111
Blackpool	20960112
Buxton	20960113
Douglas	20960114
Scarborough	20960115
Shrewsbury	20960116
Skegness	20960117
Tynemouth	20960118
York	20960119

Wales

Aberystwyth	20960120
Blaenau Ffestiniog	20960121
Cardiff	20960122
Colwyn Bay	20960123
Haverfordwest	20960124
Llandrindod Wells	20960125
Valley	20960126

Scotland & N.Ireland

Braemar	20960130
Dumfries	20960131
Edinburgh	20960132
Glasgow	20960133
Oban	20960134
Wick	20960135
Belfast	20960136
Cork	20960137
Dublin	20960138
Shannon	20960139

EUROPE & N.AFRICA

Scandinavia

Copenhagen	20960200
Helsinki	20960201
Oslo	20960202
Trondheim	20960203
Stockholm	20960204

Europe (N)

Innsbruck	20960210
Brussels	20960211
Utrecht	20960212
Geneva	20960213
Zurich	20960214
Cologne	20960215
Hamburg	20960216
Frankfurt	20960217
Munich	20960218
Stuttgart	20960219

Europe(S)

Bordeaux	20960220
Lyons	20960221
Nice	20960222
Paris	20960223
Palma	20960224
Faro	20960225
Alicante	20960226
Barcelona	20960227
Madrid	20960228
Malaga	20960229

Mediterranean & N.Africa

Algiers	20960230
Iraklion	20960231
Athens	20960232
Brindisi	20960233
Milan	20960234
Rimini	20960235
Rome	20960236
Casablanca	20960237
Tangier	20960238
Split	20960239

NORTH AMERICA

Canada

Churchill	20960300
Edmonton	20960301
Halifax	20960302
Montreal	20960303
Ottawa	20960304
Quebec	20960305
St.John's	20960306
Toronto	20960307
Vancouver	20960308
Winnipeg	20960309

USA

Chicago	20960310
Houston	20960311
Los Angeles	20960312
Miami	20960313
New Orleans	20960314
New York City	20960315
Norfolk	20960316
St. Louis	20960317
Salt Lake City	20960318
San Francisco	20960319

West Indies

Bridgetown	20960320
Hamilton	20960321
Kingston	20960322
Nassau	20960323
St.Clair	20960324

N.B. All pages have temperature data on an 'a' frame, with rainfall & sunshine on a 'b' frame.

Frame charge 4p

Appendix 6

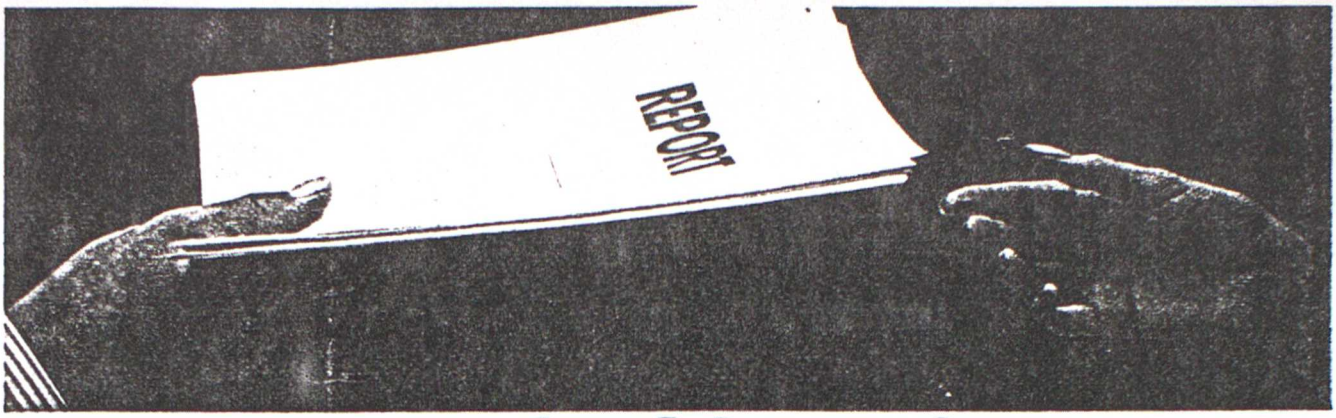
Office Equipment advertisements

Eight advertisements for various office equipment are in this appendix. They have been taken from the monthly trade journal 'Office Equipment Index' which is taken by the Met Office library.

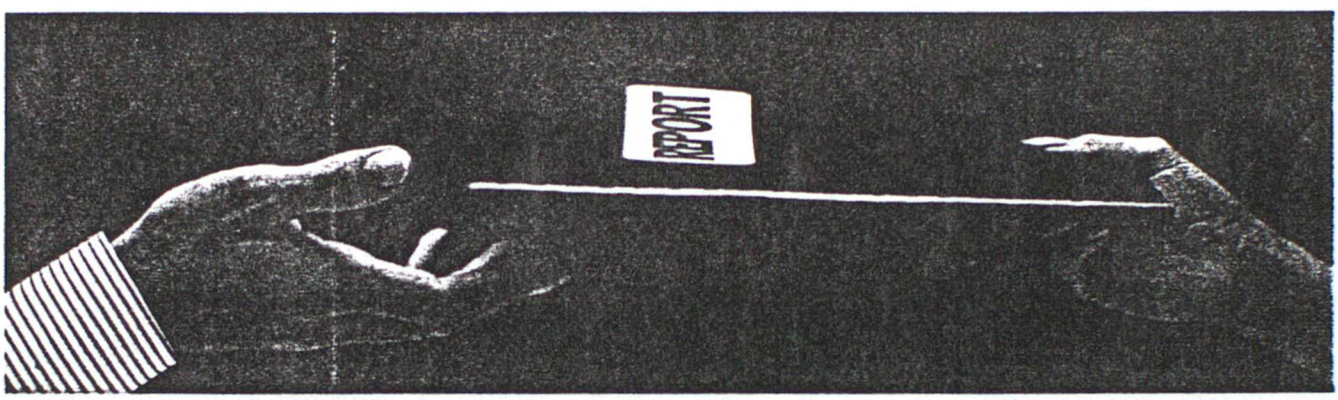
Three advertisements are for small binding machines to cover reports. Their use for enquiry replies is mentioned in chapter 6. Other advertisements are for office equipment which should be considered as possibly useful, if office procedures are changed. The display boards may be useful for a presentation room or area.

The advertisements placed in this appendix are intended to illustrate new equipment oralternatives to present equipment. The inclusion of an advertisement is not intended as a recommendation of any particular company's products.

TRANSFORM PHOTOCOPIES



IN SECONDS

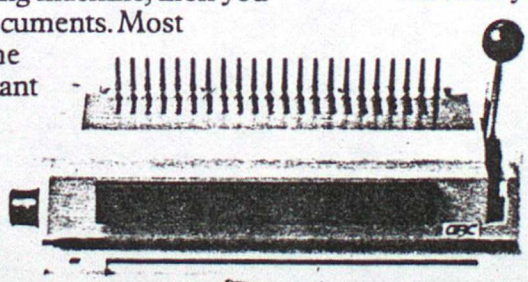


WITH COPYBIND.

If your office has a copying machine, then you obviously produce a lot of documents. Most businesses are still making the mistake of presenting important documents in folders held together with paperclips or staples, ruining impact and prestige.

GBC Copybind systems can change all that. We now produce simple desk top presentation systems, doing away with outmoded methods once and for all.

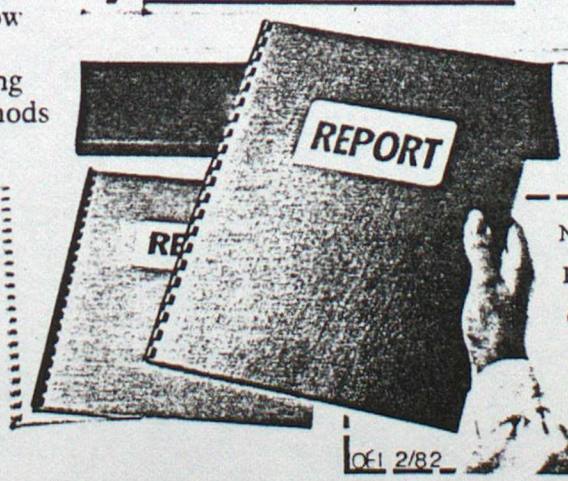
With one of our small desk top machines you can now produce a bound document in seconds, with a choice of finishes, colours and styles, which, if required, can be personalised to reflect your company's image.



Whether you need a one-off document or hundreds, our flexible systems will cope.

Invest in a few minutes now by filling in the coupon, and we'll send you comprehensive details of our Copybind systems.

You're bound to be pleased you did.



GBC

General Binding Company, Ltd.

Doman Road, Camberley, Surrey GU15 3BZ.
Tel: Camberley (0276) 62162

Name_____

Position_____

Company_____

Address_____

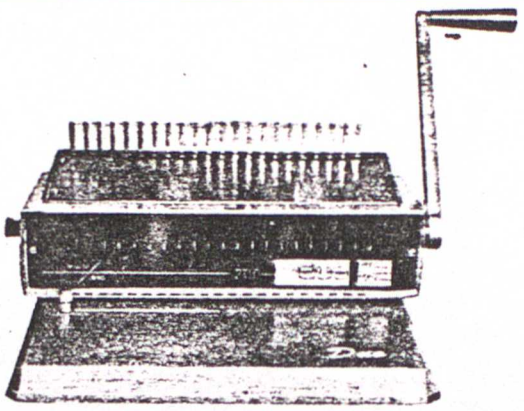
_____

Post Code_____

OF1 2/82

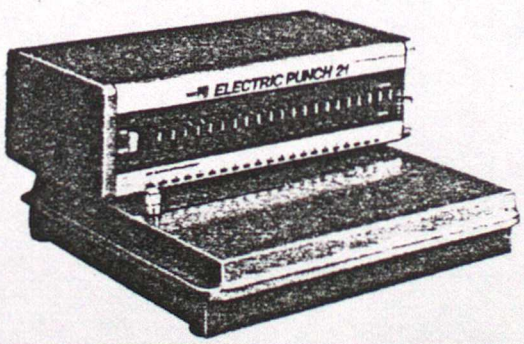
INDEXCARD REF B32

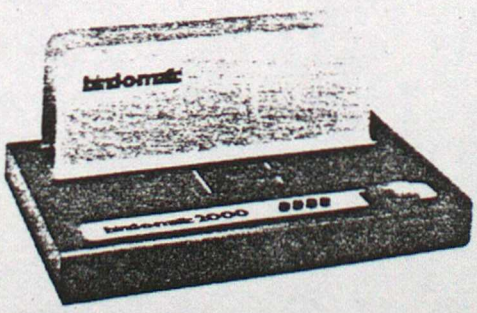
AT BUSINESS AIDS WE DON'T JUST SELL BINDING SYSTEMS, WE SELL SUCCESS.



Plastic Ring Binding

The Duo range of Plastic Ring Binders has long been an established favourite for offices and print room. Available in three manual models plus the Duo Electric.





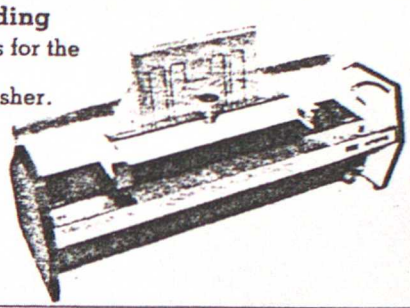
Thermal Binding

The new Bind-o-matic model gives a perfect bound finish with a de-luxe range of wrap around covers.

Business Aids, 3 Whitby Avenue, Park Royal, London. NW10 7SQ Tel. 01 965 9821

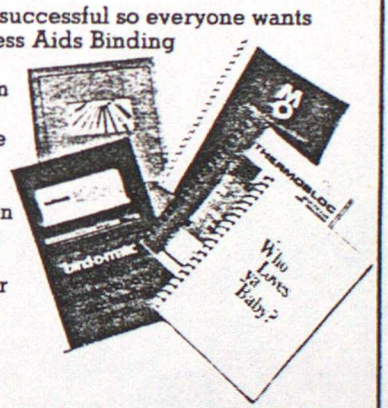
Adhesive Binding

Binding Systems for the print room and professional finisher. Quick and economic.



Everyone wants to be successful so everyone wants their work read. A Business Aids Binding System ensures it is.

Business Aids offer ten different binding systems each designed to increase impact, authority and prestige. They also have the experience, reputation and unlimited advice that helps you transform your ideas, your facts and your figures into a superb presentation.



Supplies

The Business Aids range of Binding Supplies is second to none. Cover boards, ring bindings, slide binders, all in a wide variety of colours and sizes. Always ex-stock, always quick delivery. Call us.

Ask your local dealer for a demonstration or send the coupon for more information.

☐ Please send me details of your binding systems range and the name of my nearest stockist.

☐ Please arrange for a demonstration

Name .....

Position .....

Co/Organisation .....

Address .....

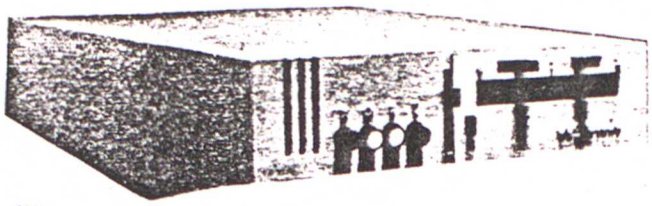
..... Tel No .....

Business Aids, 3 Whitby Avenue, Park Royal, London. NW10 7SQ Tel. 01 965 9821

BUSINESS AIDS LIMITED
the people with the finishing touch

INDEXCARD REF C40

ARE YOU PAYING FOR THE SOUND OF SILENCE



When you play back your recorded telephone messages tape, how many times have potential customers hung up without leaving a name, address, telephone number or message for you to follow up? We're willing to bet, quite a few. Chances are, they've probably rung one of your competitors, which could mean lost business for you.

With the MPI remote controlled telephone answering machine we've overcome that problem. Simply!

Instead of the usual pre-recorded announcement containing: "This is the XYZ Co. Ltd., an apology for not being here, please leave your message after the tone, etc. . . . . ", the telephone is answered as an operator would answer: "This is the XYZ Co. Ltd., who's calling please?" (Thus preceding the usual announcement).

Research and experience have proved that this simple approach is up to three times more effective in getting people to leave their name and a message. Which could mean up to three times more business for you.

And when you add this simple approach to the versatility and reliability of the MPI, which utilises the very latest technology, you have a winning combination.

Interested? Then write to or call us for further details or a demonstration.

MORE CALLS MEAN MORE BUSINESS..!

DESIGN AND MARKETING OF AUTOMATIC TELEPHONE ANSWERING AND SWITCHING SYSTEMS

NAME _____

COMPANY _____

ADDRESS _____

_____

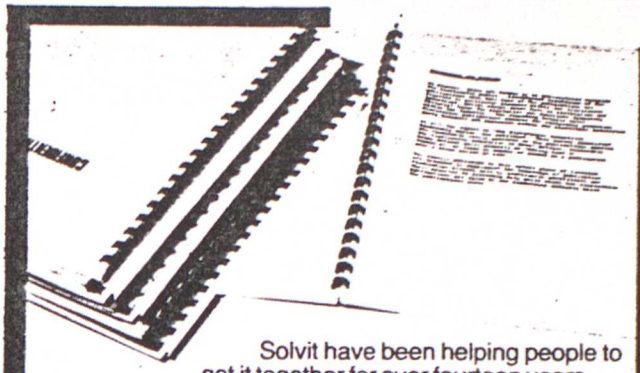
Tel. No. _____

ADVANCED ANSWERING SYSTEMS LTD.
INDEX HOUSE, ASCOT, BERKS. SL5 7EU
TEL: ASCOT (0990) 26527 TELEX: 849426

AAS

INDEXCARD REF C67

We'll help you get it together

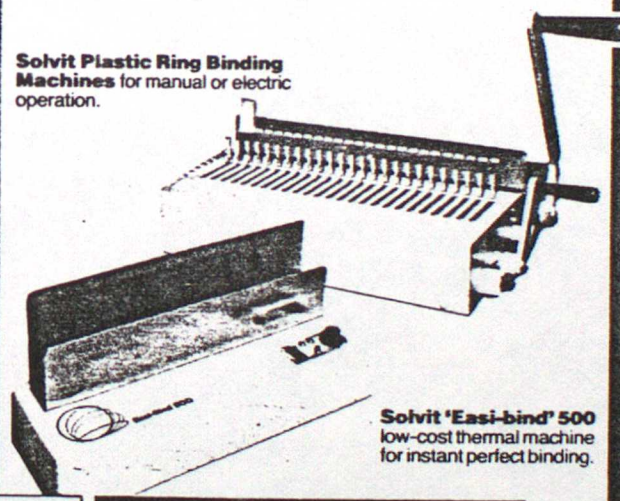


Solvit have been helping people to get it together for over fourteen years . . . brochures, reports, data manuals, in fact anything that needs binding quickly, efficiently and attractively.

Whether you need one document at a time or hundreds, Solvit desk-top binding machines are the answer. We give you the choice, too, of firm all-along-the-edge binding or plastic ring binding. Operation couldn't be quicker or easier and the bound pages open flat for ease of photocopying.

Quality of Solvit equipment is the highest obtainable anywhere. Prices will surprise you . . . pleasantly. And our service is helpful, friendly and fast. Contact Solvit. And let's get it together, together.

Solvit Plastic Ring Binding Machines for manual or electric operation.



Solvit 'Easi-bind' 500 low-cost thermal machine for instant perfect binding.

SOLVIT

SOLVIT PLASTIC BINDING COMPANY LIMITED
MM House, Sebastopol Road, Aldershot, Hants GU11 1TX
Telephone: Aldershot (0252) 313431/2

OTHERS MAY PROMISE THE EARTH. WE DELIVER THE BEST.

Fill in the coupon for the Solvit brochure, or use the reader-reply service.

Name .....

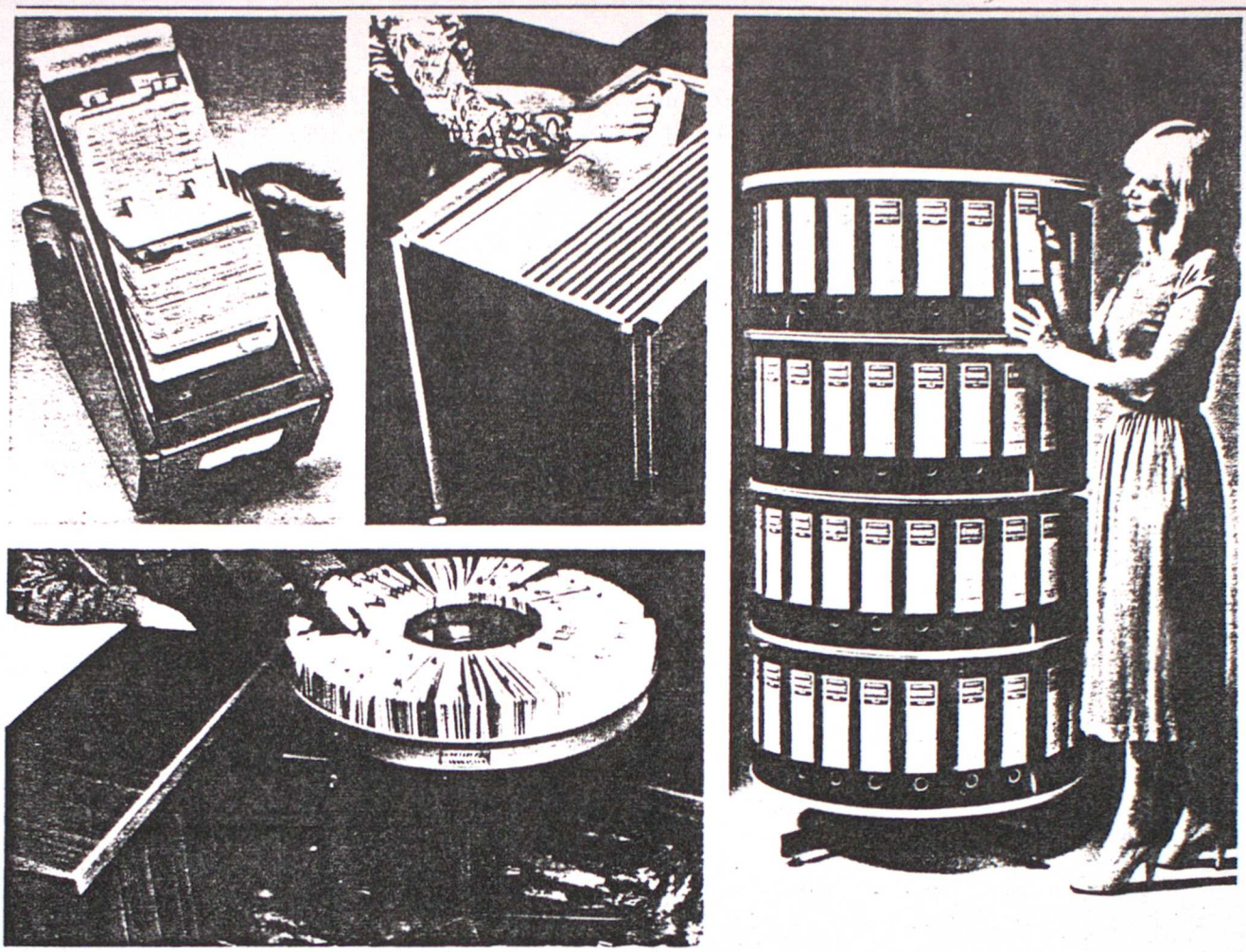
Position .....

Company .....

Address .....

.....

INDEXCARD REF C10



Rotadex. The making of an efficient office.

Fast access to essential data is easily achieved with Rotadex card filing systems.

The enormous range of Vertical, Horizontal and Visible Units means we can supply the system that meets your requirements exactly.

Whether you're looking for a desk mounted, floor standing or mobile model.

And you could save up to 50% storage space with the superbly efficient Platfile. It stores lever arch or box files on up to five independently revolving platforms.

With Rotadex you're economically efficient too, because our prices compare extremely favourably with other systems.

But most important of all we do our utmost to ensure you get the system that will really streamline your office routines.

Whatever the type and size of business we can help you select the equipment that's just made for the job in hand.

And for special applications we're vastly experienced in the printing of all cards, forms and other stationery.

In fact, if you're talking about office efficiency, you're probably talking about Rotadex.

Write or phone for details.

ROTADEX

RECORDING SYSTEMS BORN OF LOGIC.

Rotadex Systems Limited, Head Office and Showroom, 3/5 Fortnum Close, Kitts Green, Birmingham B33 0JL.
Telephone: 021-783 7411.

681

INDEXCARD REF B9

elf-assembly display

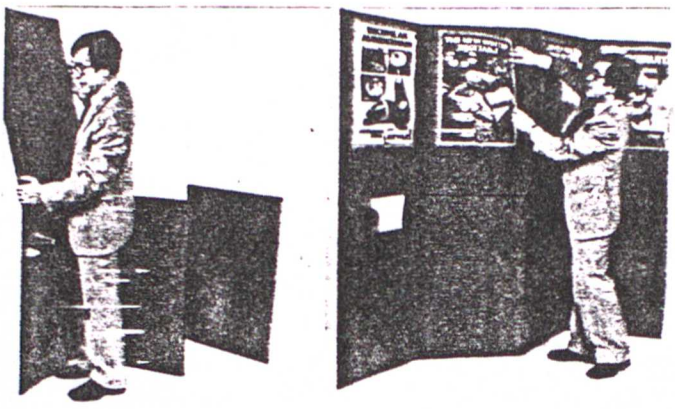
Screen-mounted display kit

The Impac free-standing self-assembly display unit from Kepac consists of eight permanently hinged panels which unfold and clip together to form a screen measuring 8ft wide by 6ft high.

Graphics or information sheets can be attached to the panel by Velcro grip-tabs.

Impac is available in eight colours, and accessories include spotlights, leaflet dispensers and a waterproof storage bag. It costs around £195.

INDEXCARD REF C233



mate £18.95

OFFICE CONFERENCE ROOMS

MARKER BOARD SUPPLIES LTD

We make fine quality
Blackboards, Whiteboards, Greenboards, Projection Boards, Dri and Wet Wipe Boards, Ruled Boards, Sliding Boards, Pinboards, Glassboards, Rollerboards.
Explain it better on a Marker Board

We also stock Pens and Markers for every need.

Phone or write for free brochure

MARKER BOARD SUPPLIES LTD

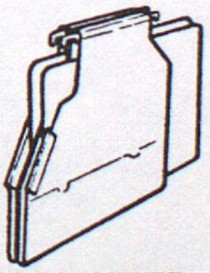
Keg Services, Twyford Road, Rotherwas
Hereford, England HR2 6JR
Phone: Hereford (0432) 6062
Telex No. 35164 MBSKEG G

INDEXCARD REF C58

RAILEX

The most versatile range of filing cabinets available today.

The perfect case for lateral filing systems.



Railex filing cabinets come in all shapes and sizes. With a variety of finishes from steel to smart Timberline for the top executive. Plus five different types of front closing.

And all Railex cabinets can be fitted with suspended or shelf filing systems, depending on your needs. For documents, computer printouts, records, orders.

If it sounds like the answer to your filing problems simply return the coupon below for further information.

FRANK WILSON (FILING) LIMITED.
Railex House, 13 City Road, London EC1Y 1AA. Tel: 01-628 4507
Railex Works, Manor Road, Southport PR9 7LH. Tel: (0704) 26866

RAILEX FILING FURNITURE

Frank Wilson (Filing) Ltd, Railex House, 13 City Road, London EC1Y 1AA
Tel: 01-628 4507

Please send me complete details of: Railex cabinets

Name .....
Company ..... Position .....
Address .....
..... Tel .....

Britain's best filing systems.

INDEXCARD REF B67

(Appendix 7)

The possible forms of the Search Code

In Fig A.7.1., the flow of the programme to analyse enquiries, XSEARCH, has been generalised. In any analysis of enquiries the descriptive group numbers to be found (Tables 3.2 to 3.4) are placed in a 'search code' and simply matched against each Enquiry Classification Code.

In Fig A.7.2., the decisions are shown that are needed to decide which classes of the Enquiry Classification Code are to be examined. These decisions are made by looking at the form of the Search Code. As can be seen either one, two or three classes may need to be examined. (At present three classes cannot be examined).

The decision as to what parts of the Enquiry Classification Code are to be examined is further complicated by there being possibly two descriptive group numbers in each class of the Enquiry Classification Code. Let the case be considered where only one class is to be examined.

There are three possible ways allowed in which the two descriptive group numbers of one class may be examined. These are:

a) The first group of the class only.

By the definition of group 10 in the profession class, 'High St' Solicitor, this will not be paired with a group number in the second position of the profession class i.e. the profession class of the Enquiry Classification Code would be 1000 ('ten-zero-zero').

Thus, there would be no point searching the second position of the class for a listing of the group number 10 as it will always be in the first position.

Thus the Search Code would be:

1000 0000 0000

implying only the first group of the first class, of the Enquiry Classification Codes, is to be searched.

b) Examine both the first and second group of the class for the same descriptive code number.

If all enquiries were wanted that had descriptive group number 12 in the 'data requested' class (visibility, fog or cloud cover), then a search of both the first and second positions needs to be carried out.

The Search Code would be:

0000 0000 1212

This may be interpreted as 'examine both positions one and two of the data requested class for code 12'.

(See also the first and second examples in Fig 3.1).

c) Examine both the first and second groups of the class for a specific pair of code numbers.

It may be decided to look for enquiries whose purpose in requesting information was to obtain advice for the siting of roads. The two descriptive code numbers in the purpose class that best cover this are 03 (Road transport) and 12 (Weather 'Limits', including siting). As mentioned in chapter 3, any pair of codes in each of the three classes that constitute the Enquiry Classification Code, must be in numerical order. Therefore 03 and 13 codes in the purpose class will not be noted as _____1303 _____ but as _____ 0313 _____. Similarly, the Search Code to look for this would be:

0000 0313 0000

This may be interpreted as: 'search for code 03 in position one of the purpose class paired with code 13 in position two of the purpose class. Only list the enquiry in output if both these conditions are fulfilled'.

Any of the three Search Code forms described above can be applied to any one class of the Enquiry Classification Code. However, any two classes can be examined (three classes, i.e. Profession, Purpose and Data Requested altogether cannot be examined at present). In each of the two classes to be analysed, either of the three Search Code formats above can be used. The link between the two classes is a Fortran logical 'AND'. Thus in example 3 of Figure 3.1, the Search Code was:

0505 0505 0000

This implies 'Search for a listing of code 05 in the first or second position of the profession class and a listing of code 05 in the first or second position of the purpose class'. An interpretation would be: 'look for any builder who wanted data for building purposes'.

Suppose for example that it was wanted to study enquiries from Oil companies who were interested in energy research. The appropriate profession classes would be commercial (04) and energy (13). The appropriate purpose classes would be research (06) and energy (13). The appropriate Search Code would therefore be:

0413 0613 0000

Fig A.7.1. A schematic explanation of XSEARCH, a programme to analyse past enquiries.

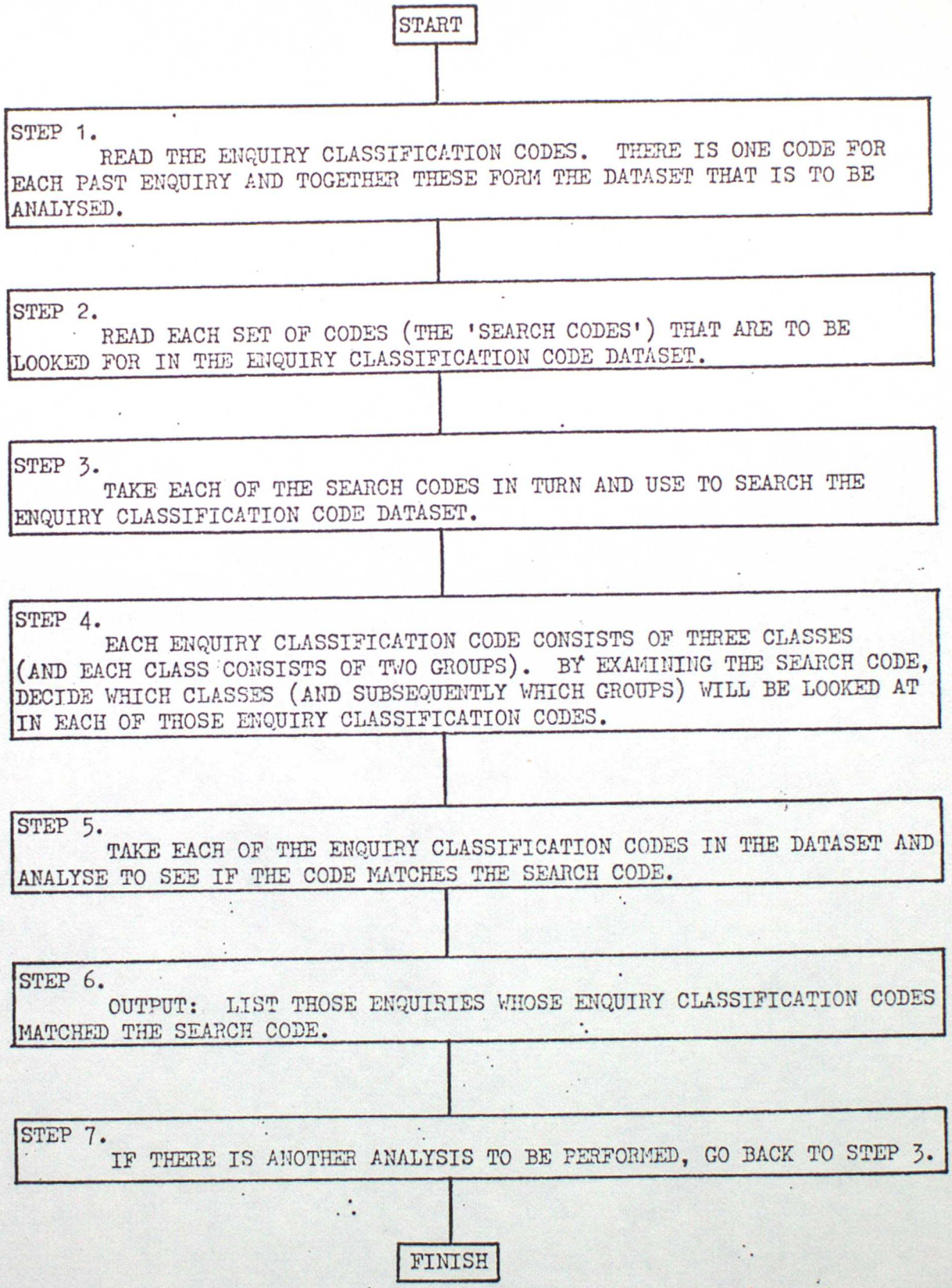
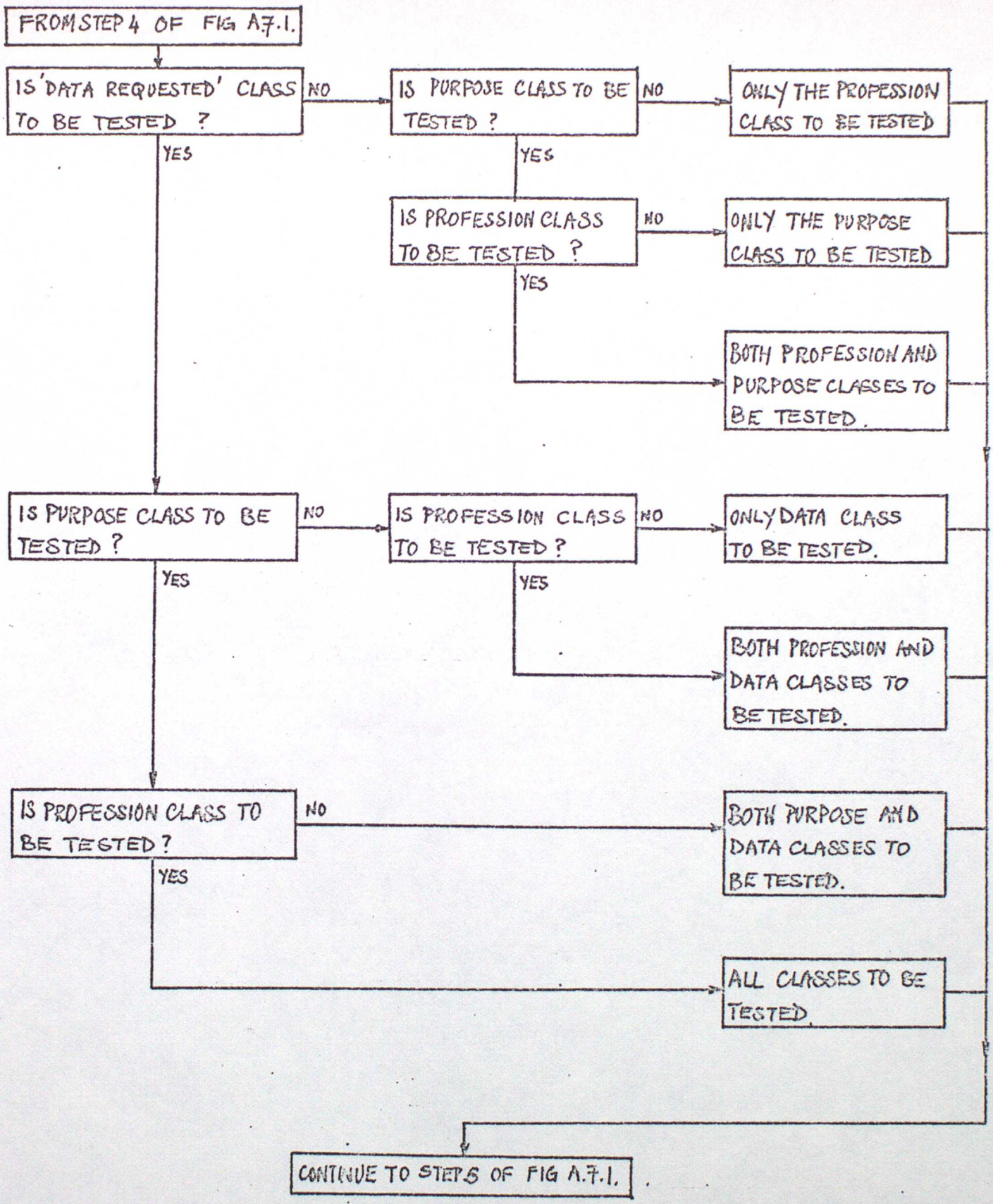


FIG A.7.2. TESTING THE SEARCH CODE TO SEE WHICH COMBINATION OF CLASSES IS TO BE TESTED.



Appendix 8

BMDP graphical output

BMDP statistical software was used to produce these diagrams of 1981 3b charge data. The diagrams include:

A.8.1 to A.8.15	Histograms of 1981 charges in each class of the present enquiry classification.
A.8.16	Histogram of May 1981 charge data for all classes. Each class is denoted by a different letter.
A.8.17	As 8.16, for August 1981.
A.8.18	Cumulative histogram of all 1981 3b enquiry charges.
A.8.19	Cumulative histogram of 1981 3b enquiry charges in the Building class.
A.8.20	As A.8.19, for the Commercial class.
A.8.21	As A.8.19, for the Industrial class.
A.8.22	As A.8.19, for the Legal class.
A.8.23	As A.8.19, for the Research class.

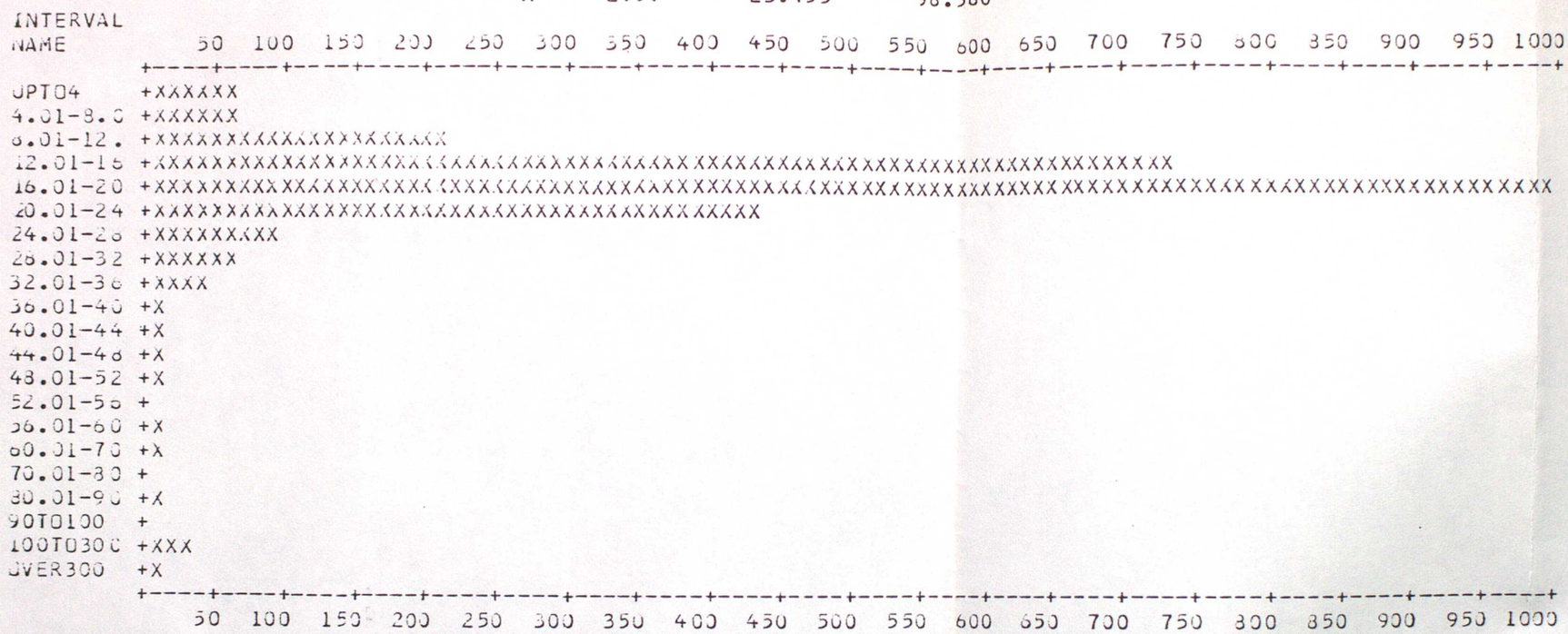
Please note the contraction of the charge scale above £60.

(Graphs for the more numerous enquiry classes only, are presented in this copy of the report. These are figs A8.1, A8.3, A8.4, A8.8, A8.11, and A8.16 to A8.23. The full set of diagrams are to be found in the master copy of the report).

PAGE 4 ANALYSIS OF ALL 1981 3B ENQUIRY CHARGES

HISTOGRAM OF VARIABLE 4 CHARGE

SYMBOL	COUNT	MEAN	ST.DEV.
X	2797	23.455	98.560



INTERVAL NAME	FREQUENCY INT.	FREQUENCY CUM.	PERCENTAGE INT.	PERCENTAGE CUM.
UPTO4	63	63	2.3	2.3
4.01-8.0	64	127	2.3	4.5
8.01-12.	205	332	7.3	11.9
12.01-16	728	1060	26.0	37.9
16.01-20	994	2054	35.5	73.4
20.01-24	432	2486	15.4	88.9
24.01-28	85	2571	3.0	91.9
28.01-32	61	2632	2.2	94.1
32.01-36	40	2672	1.4	95.5
36.01-40	10	2682	0.4	95.9
40.01-44	13	2695	0.5	96.4
44.01-48	9	2704	0.3	96.7
48.01-52	9	2713	0.3	97.0
52.01-56	4	2717	0.1	97.1
56.01-60	14	2731	0.5	97.6
60.01-70	13	2744	0.5	98.1
70.01-80	2	2746	0.1	98.2
80.01-90	8	2754	0.3	98.5
90TO100	4	2758	0.1	98.6
100TO300	28	2786	1.0	99.6
OVER300	11	2797	0.4	100.0

Fig A.8.1. Histogram of all 1981 3b enquiry charges.

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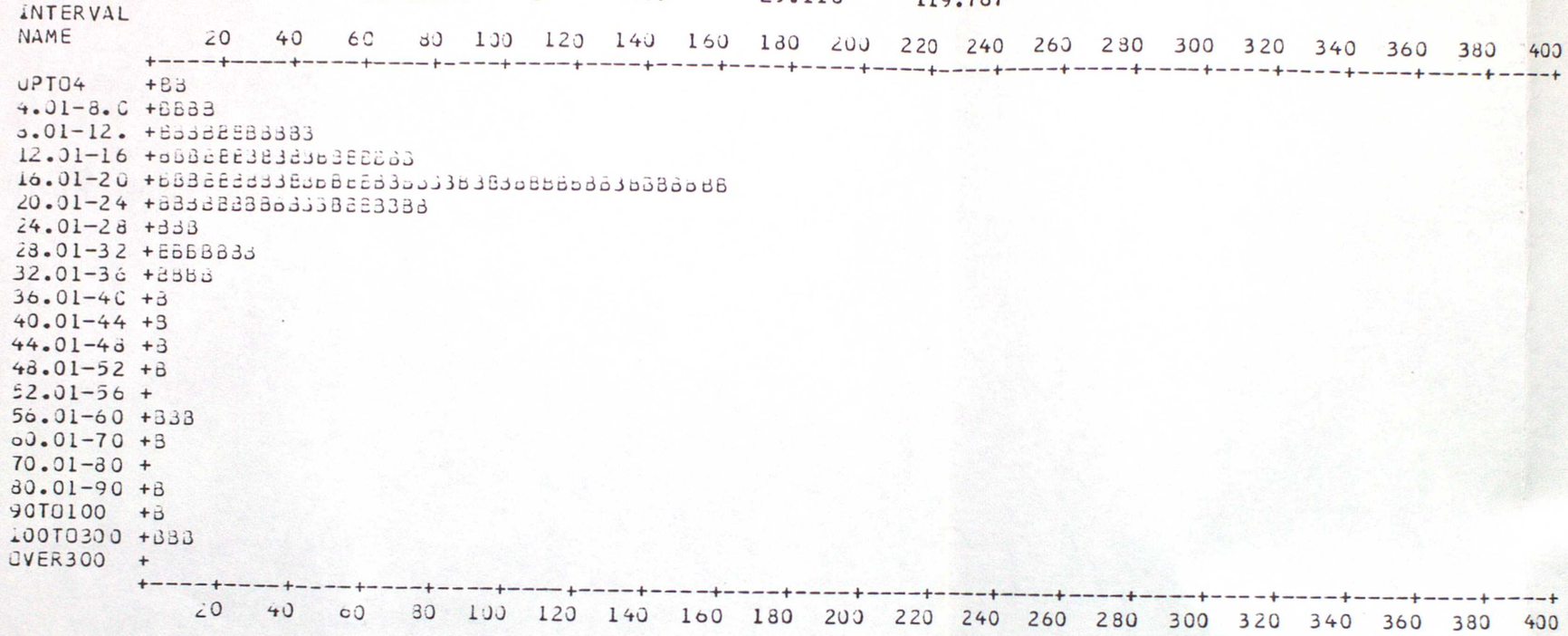
HISTOGRAM OF VARIABLE 4 CHARGE

	SYMBOL	COUNT	MEAN	ST.DEV.
BUILDING	B	475	29.118	119.767



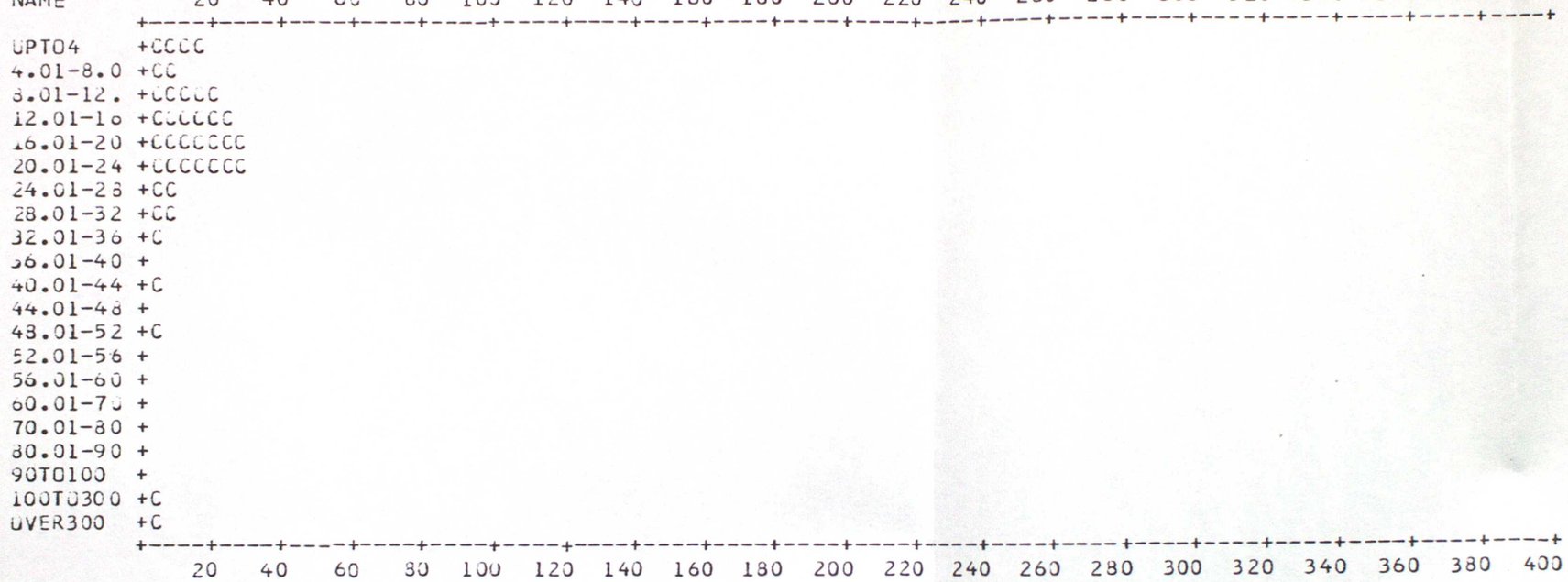
FREQUENCY INT.	FREQUENCY CUM.	PERCENTAGE INT.	PERCENTAGE CUM.
6	6	1.3	1.3
15	21	3.2	4.4
44	65	9.3	13.7
73	138	15.4	29.1
160	298	33.7	62.7
75	373	15.8	78.5
13	386	2.7	81.3
28	414	5.9	87.2
16	430	3.4	90.5
2	432	0.4	90.9
4	436	0.8	91.8
5	441	1.1	92.8
3	444	0.6	93.5
1	445	0.2	93.7
10	455	2.1	95.8
3	458	0.6	96.4
1	459	0.2	96.6
3	462	0.6	97.3
2	464	0.4	97.7
10	474	2.1	99.8
1	475	0.2	100.0

Fig A.8.3 1981 Building Charges.

ANALYSIS OF ALL 1981 3B ENQUIRY CHARGES

HISTOGRAM OF VARIABLE 4 CHARGE

	SYMBOL	COUNT	MEAN	ST.DEV.
COMMERCE	C	154	53.143	338.858



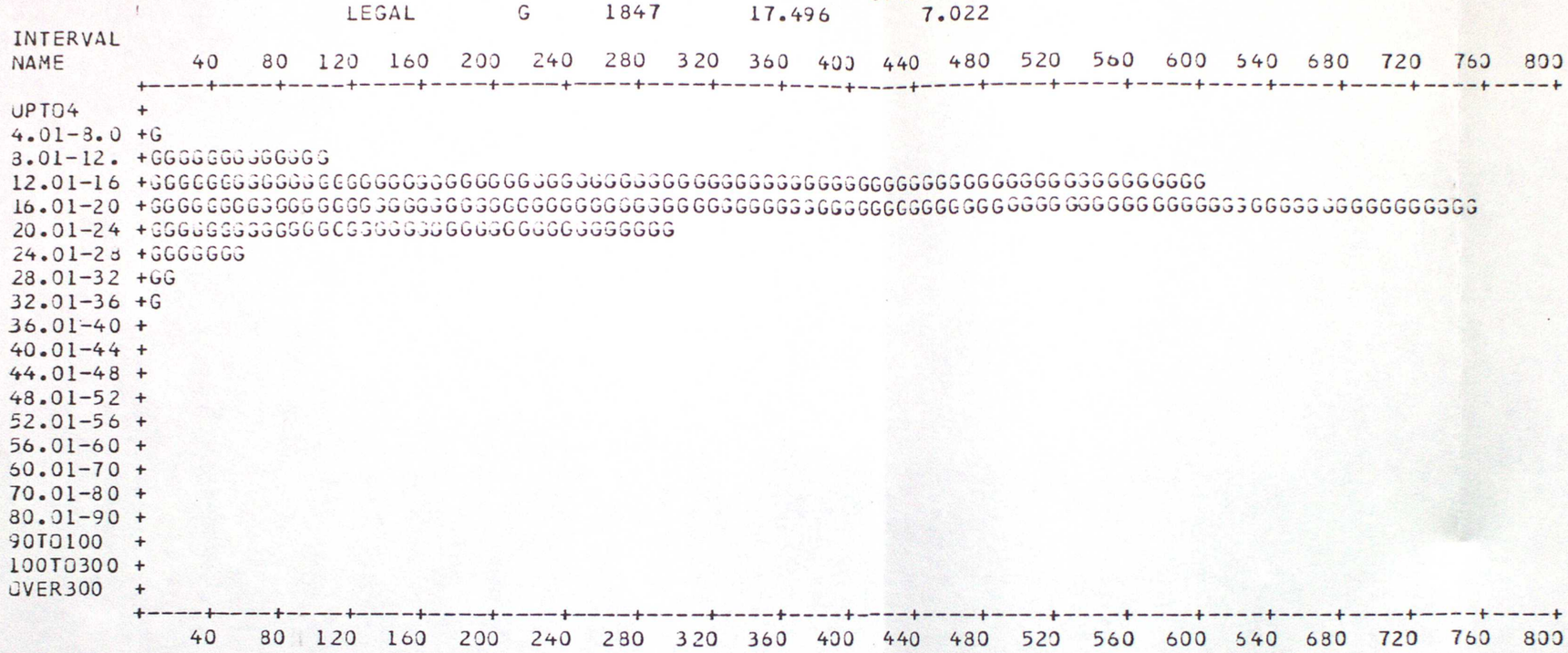
FREQUENCY INT.	FREQUENCY CUM.	PERCENTAGE INT.	PERCENTAGE CUM.
14	14	9.1	9.1
7	21	4.5	13.6
21	42	13.6	27.3
23	65	14.9	42.2
28	93	18.2	60.4
28	121	18.2	78.6
6	127	3.9	82.5
7	134	4.5	87.0
5	139	3.2	90.3
0	139	0.0	90.3
3	142	1.9	92.2
0	142	0.0	92.2
3	145	1.9	94.2
1	146	0.6	94.8
0	146	0.0	94.8
1	147	0.6	95.5
0	147	0.0	95.5
1	148	0.6	96.1
1	149	0.6	96.8
2	151	1.3	98.1
3	154	1.9	100.0

Fig A.8.4. 1981 Commerical Charges.

PAGE 5 ANALYSIS OF ALL 1981 3B ENQUIRY CHARGES (LEGAL ONLY)

HISTOGRAM OF VARIABLE 4 CHARGE

	SYMBOL	COUNT	MEAN	ST.DEV.
LEGAL	G	1847	17.496	7.022


INTERVAL NAME
40 80 120 160 200 240 280 320 360 400 440 480 520 560 600 640 680 720 760 800
UPTO4 +
4.01-8.0 +G
8.01-12. +GGGGGGGGGGGG
12.01-16 +GGGGGGGGGGG

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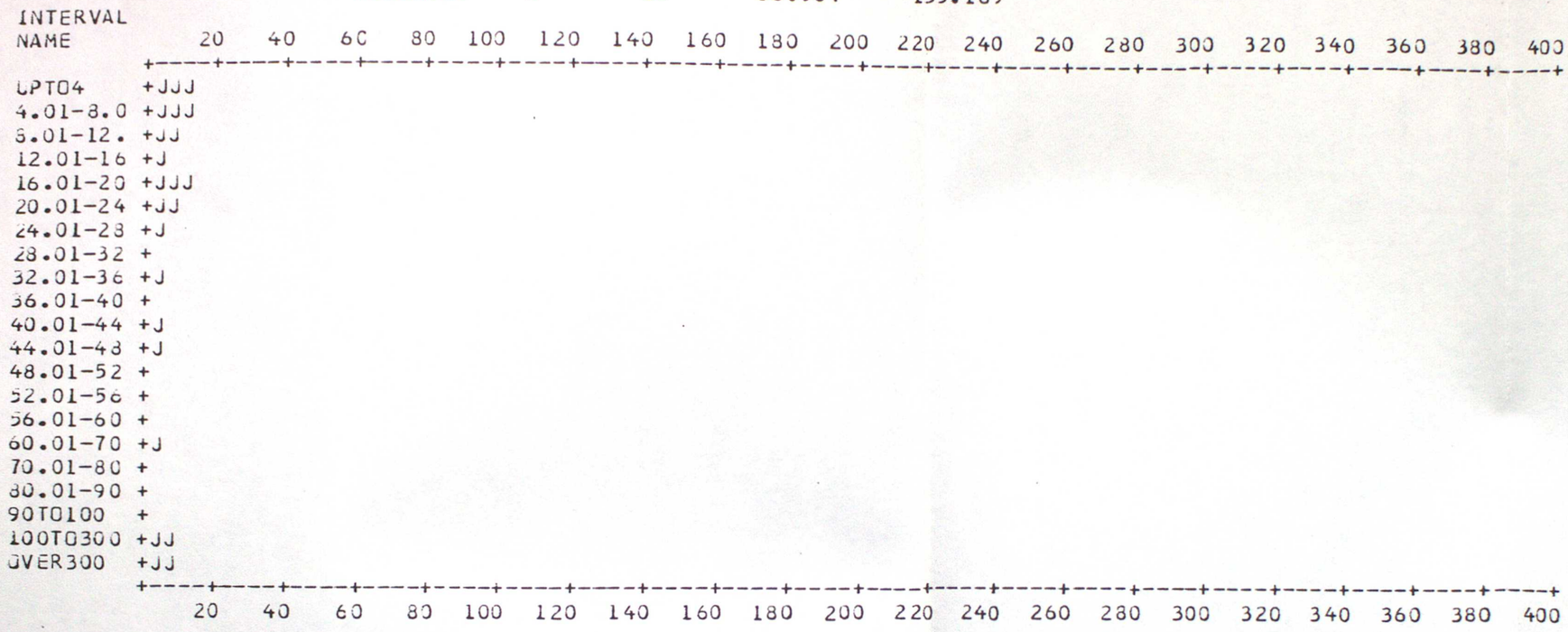
HISTOGRAM OF VARIABLE 4 CHARGE

	SYMBOL	COUNT	MEAN	ST.DEV.
RESEARCH	J	86	68.907	155.189



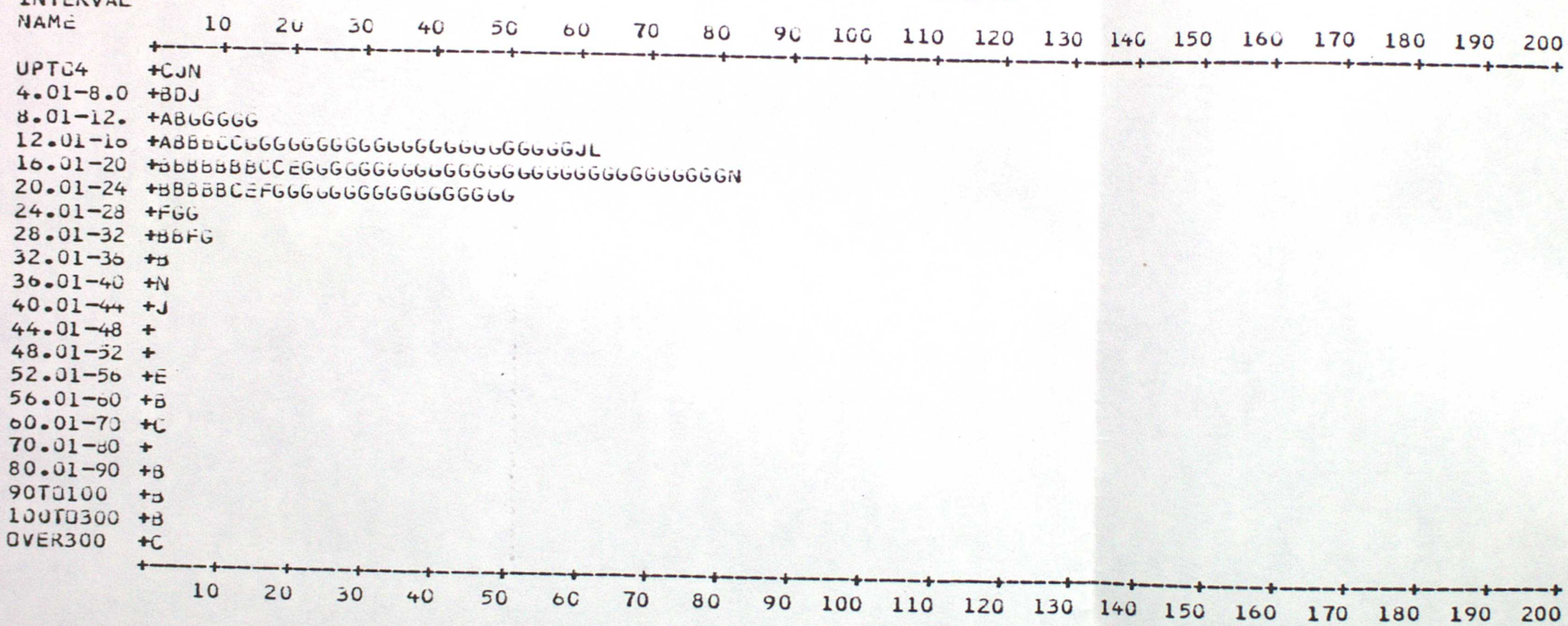
FREQUENCY INT.	FREQUENCY CUM.	PERCENTAGE INT.	PERCENTAGE CUM.
10	10	11.6	11.6
11	21	12.8	24.4
9	30	10.5	34.9
4	34	4.7	39.5
11	45	12.8	52.3
9	54	10.5	62.8
3	57	3.5	66.3
0	57	0.0	66.3
3	60	3.5	69.8
0	60	0.0	69.8
2	62	2.3	72.1
2	64	2.3	74.4
1	65	1.2	75.6
1	66	1.2	76.7
1	67	1.2	77.9
5	72	5.8	83.7
0	72	0.0	83.7
1	73	1.2	84.9
0	73	0.0	84.9
7	80	8.1	93.0
6	86	7.0	100.0

Fig A.8.11. 1981 Research Charges.

PAGE 47 ANALYSIS OF MAY 1981 3B ENQUIRY CHARGES

HISTOGRAM OF VARIABLE 4 CHARGE

	SYMBOL	COUNT	MEAN	ST.DEV.
AGRI	A	2	12.420	1.301
BUILDING	B	42	25.766	21.156
COMMERCE	C	14	57.368	144.673
EDUCATON	D	1	4.600	0.0
HEATING	E	4	29.555	15.660
INDUSTRL	F	8	21.519	6.515
LEGAL	G	156	17.602	4.206
MEDICAL	H	2	16.100	1.626
PRESS	I	0	0.0	0.0
RESEARCH	J	7	25.640	37.209
SPORT	K	0	0.0	0.0
TRNSPORT	L	2	15.510	0.424
MISCKNOW	M	1	2.000	0.0
WHOKNOWS	N	5	23.850	24.341



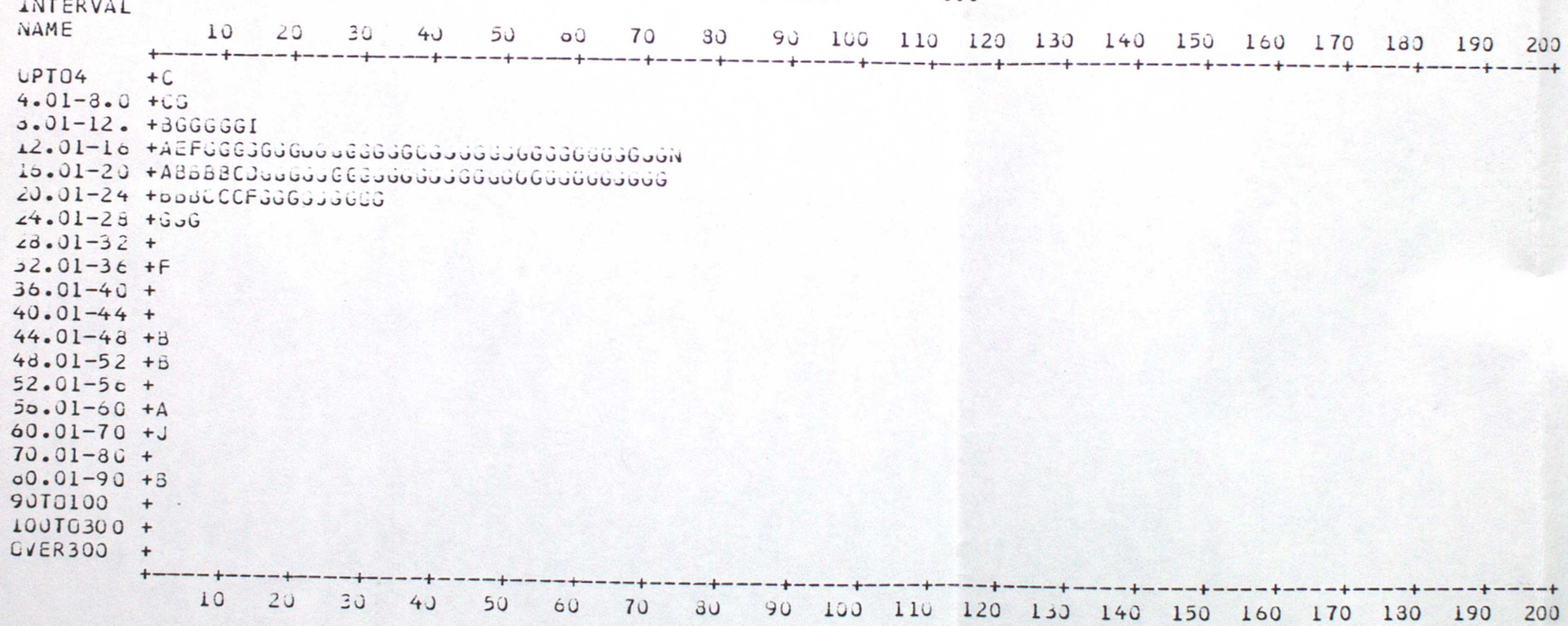
FREQUENCY INT.	FREQUENCY CUM.	PERCENTAGE INT.	PERCENTAGE CUM.
6	6	2.5	2.5
5	11	2.0	4.5
14	25	5.7	10.2
61	86	25.0	35.2
81	167	33.2	68.4
50	217	20.5	88.9
6	223	2.5	91.4
8	231	3.3	94.7
2	233	0.8	95.5
1	234	0.4	95.9
1	235	0.4	96.3
0	235	0.0	96.3
0	235	0.0	96.3
1	236	0.4	96.7
2	238	0.8	97.5
1	239	0.4	98.0
0	239	0.0	98.0
1	240	0.4	98.4
1	241	0.4	98.8
2	243	0.8	99.6
1	244	0.4	100.0

Fig A.8.16. Charges in each category for May 1981.

ANALYSIS OF AUGUST 1981 SB ENQUIRY CHARGES

HISTOGRAM OF VARIABLE 4 CHARGE

	SYMBOL	COUNT	MEAN	ST.DEV.
AGRI	A	3	30.973	23.066
BUILDING	B	19	25.250	17.997
COMMERCE	C	13	16.302	7.438
EDUCATON	D	1	17.250	0.0
HEATING	E	3	38.647	41.053
INDUSTRL	F	4	23.127	7.239
LEGAL	G	159	16.464	3.046
MEDICAL	H	0	0.0	0.0
PRESS	I	1	11.790	0.0
RESEARCH	J	2	37.375	36.593
SPORT	K	0	0.0	0.0
TRNSPORT	L	0	0.0	0.0
MISCKNOW	M	0	0.0	0.0
WHOKNOWS	N	1	14.260	0.0



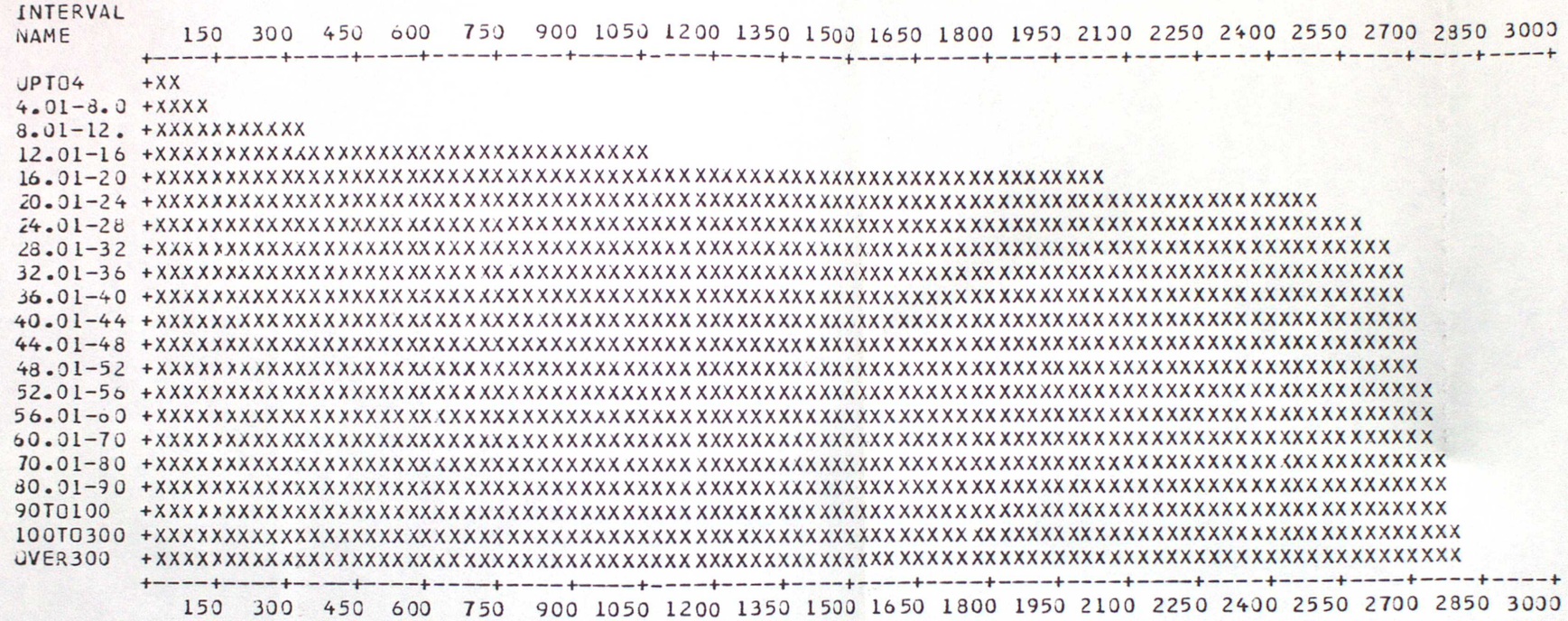
FREQUENCY INT.	FREQUENCY CUM.	PERCENTAGE INT.	PERCENTAGE CUM.
1	1	0.5	0.5
3	4	1.5	1.9
14	18	6.8	8.7
73	91	35.4	44.2
71	162	34.5	78.6
31	193	15.0	93.7
6	199	2.9	96.6
0	199	0.0	96.6
1	200	0.5	97.1
0	200	0.0	97.1
0	200	0.0	97.1
1	201	0.5	97.6
1	202	0.5	98.1
0	202	0.0	98.1
1	203	0.5	98.5
1	204	0.5	99.0
0	204	0.0	99.0
2	206	1.0	100.0
0	206	0.0	100.0
0	206	0.0	100.0
0	206	0.0	100.0

Fig A.8.17. Charges in each category for August 1981.

PAGE 8 ANALYSIS OF ALL 1981 3B ENQUIRY CHARGES

CUMULATIVE HISTOGRAM OF VARIABLE 4 CHARGE

SYMBOL	COUNT	MEAN	ST.DEV.
X	2797	23.455	98.560



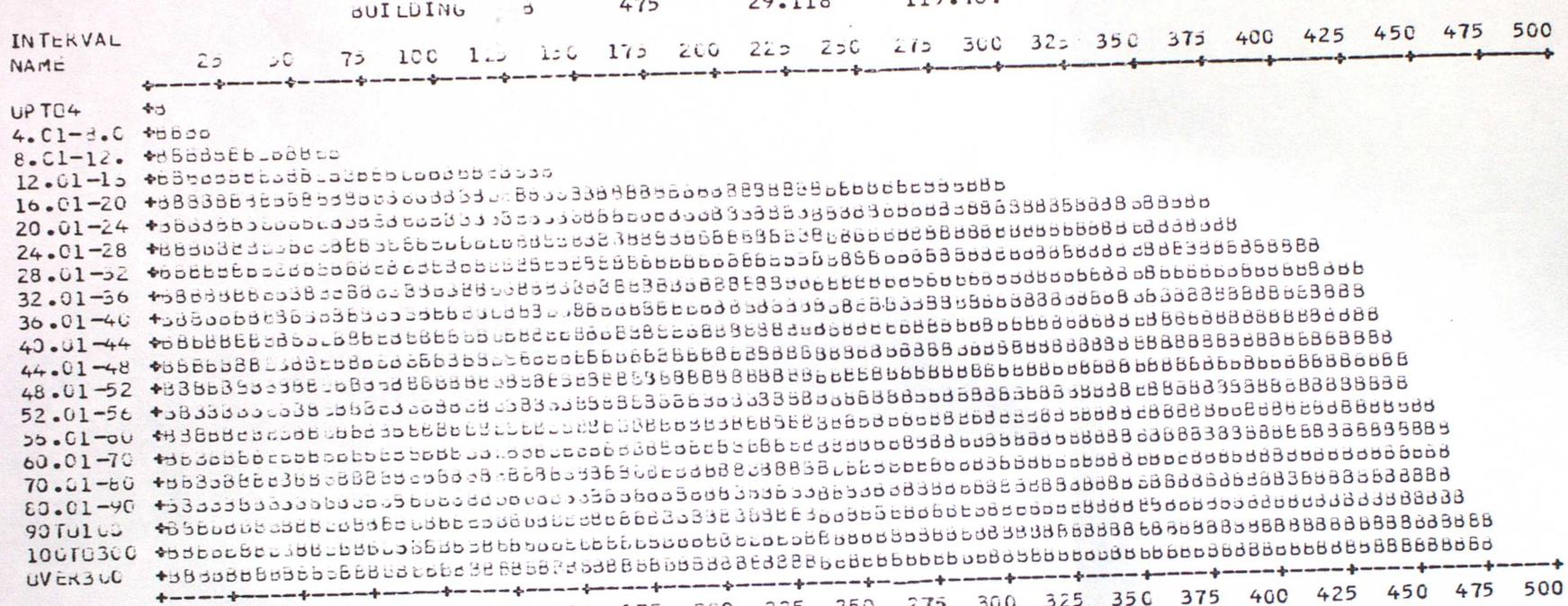
INTERVAL NAME	FREQUENCY INT.	FREQUENCY CUM.	PERCENTAGE INT.	PERCENTAGE CUM.
UPTO4	63	63	2.3	2.3
4.01-8.0	64	127	2.3	4.5
8.01-12.	205	332	7.3	11.9
12.01-16	728	1060	26.0	37.9
16.01-20	994	2054	35.5	73.4
20.01-24	432	2486	15.4	88.9
24.01-28	85	2571	3.0	91.9
28.01-32	61	2632	2.2	94.1
32.01-36	40	2672	1.4	95.5
36.01-40	10	2682	0.4	95.9
40.01-44	13	2695	0.5	96.4
44.01-48	9	2704	0.3	96.7
48.01-52	9	2713	0.3	97.0
52.01-56	4	2717	0.1	97.1
56.01-60	14	2731	0.5	97.6
60.01-70	13	2744	0.5	98.1
70.01-80	2	2746	0.1	98.2
80.01-90	8	2754	0.3	98.5
90TO100	4	2758	0.1	98.6
100TO300	28	2786	1.0	99.6
OVER300	11	2797	0.4	100.0

Fig A.8.18. Cumulative histogram of all 1981 3b enquiry charges.

PAGE 5 ANALYSIS OF ALL 1981 3d ENQUIRY CHARGES

CUMULATIVE HISTOGRAM OF VARIABLE 4 CHARGE

	SYMBOL	COUNT	MEAN	ST.DEV.
BUILDING	5	475	29.118	119.767



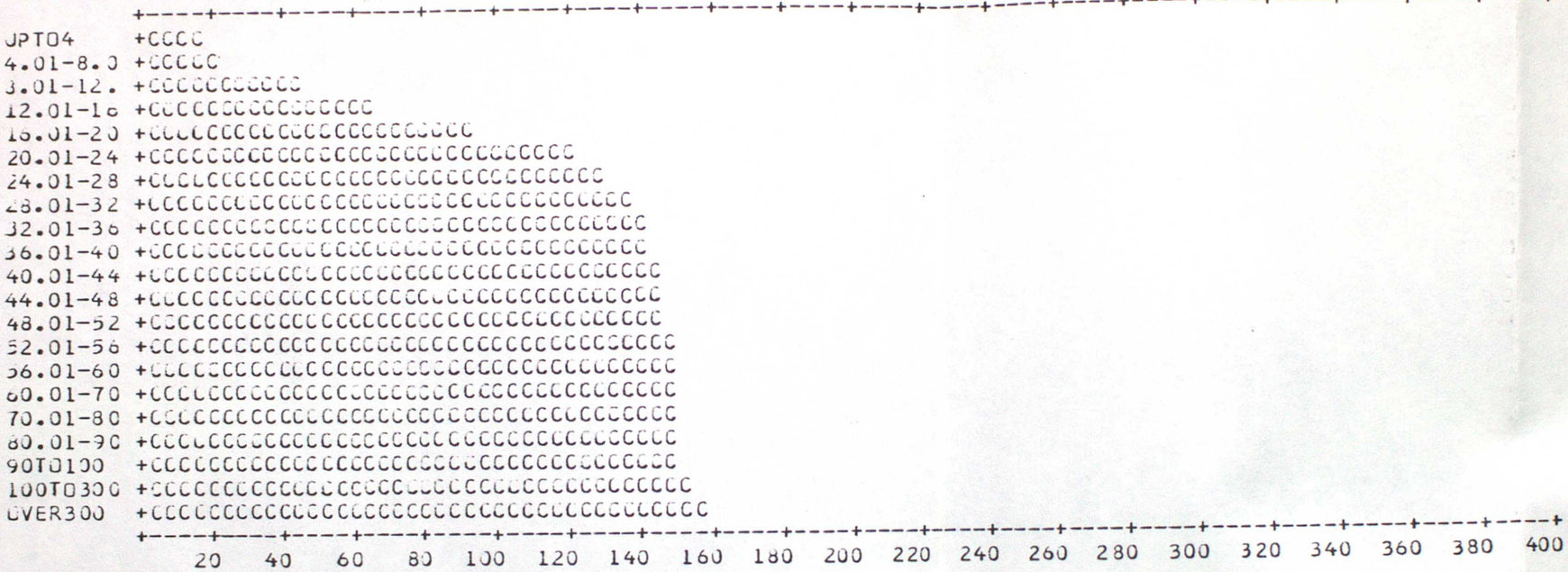
FREQUENCY INT.	FREQUENCY CUM.	PERCENTAGE INT.	PERCENTAGE CUM.
6	6	1.3	1.3
15	21	3.2	4.4
44	65	9.3	13.7
73	138	15.4	29.1
160	298	33.7	62.7
75	373	15.8	78.5
13	386	2.7	81.3
28	414	5.9	87.2
16	430	3.4	90.5
2	432	0.4	90.9
4	436	0.8	91.8
5	441	1.1	92.8
3	444	0.6	93.5
1	445	0.2	93.7
10	455	2.1	95.8
3	458	0.6	96.4
1	459	0.2	96.6
3	462	0.6	97.3
2	464	0.4	97.7
10	474	2.1	99.8
1	475	0.2	100.0

Fig A.8.19. 1981 Building charges.

PAGE 13 ANALYSIS OF ALL 1981 38 ENQUIRY CHARGES

CUMULATIVE HISTOGRAM OF VARIABLE 4 CHARGE

	SYMBOL	COUNT	MEAN	ST.DEV.
COMMERCE	C	154	53.143	338.858



	FREQUENCY		PERCENTAGE	
	INT.	CUM.	INT.	CUM.
UPTO4	14	14	9.1	9.1
4.01-8.0	7	21	4.5	13.6
8.01-12.	21	42	13.6	27.3
12.01-16	23	65	14.9	42.2
16.01-20	28	93	18.2	60.4
20.01-24	28	121	18.2	78.6
24.01-28	6	127	3.9	82.5
28.01-32	7	134	4.5	87.0
32.01-36	5	139	3.2	90.3
36.01-40	0	139	0.0	90.3
40.01-44	3	142	1.9	92.2
44.01-48	0	142	0.0	92.2
48.01-52	3	145	1.9	94.2
52.01-56	1	146	0.6	94.8
56.01-60	0	146	0.0	94.8
60.01-70	1	147	0.6	95.5
70.01-80	0	147	0.0	95.5
80.01-90	1	148	0.6	96.1
90TO100	1	149	0.6	96.8
100TO300	2	151	1.3	98.1
OVER300	3	154	1.9	100.0

Fig A.8.20. 1981 Commercial charges.

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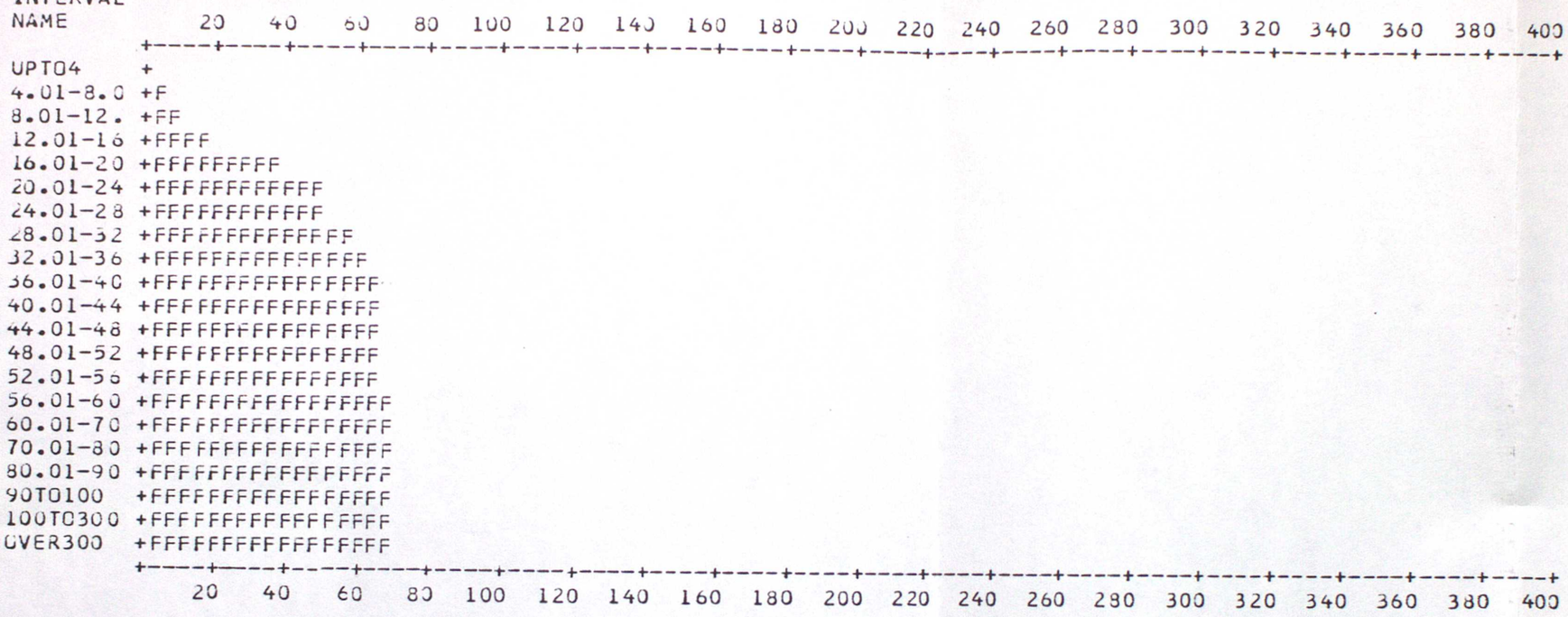
CUMULATIVE HISTOGRAM OF VARIABLE 4 CHARGE

	SYMBOL	COUNT	MEAN	ST.DEV.
INDUSTRI	F	69	25.320	17.657



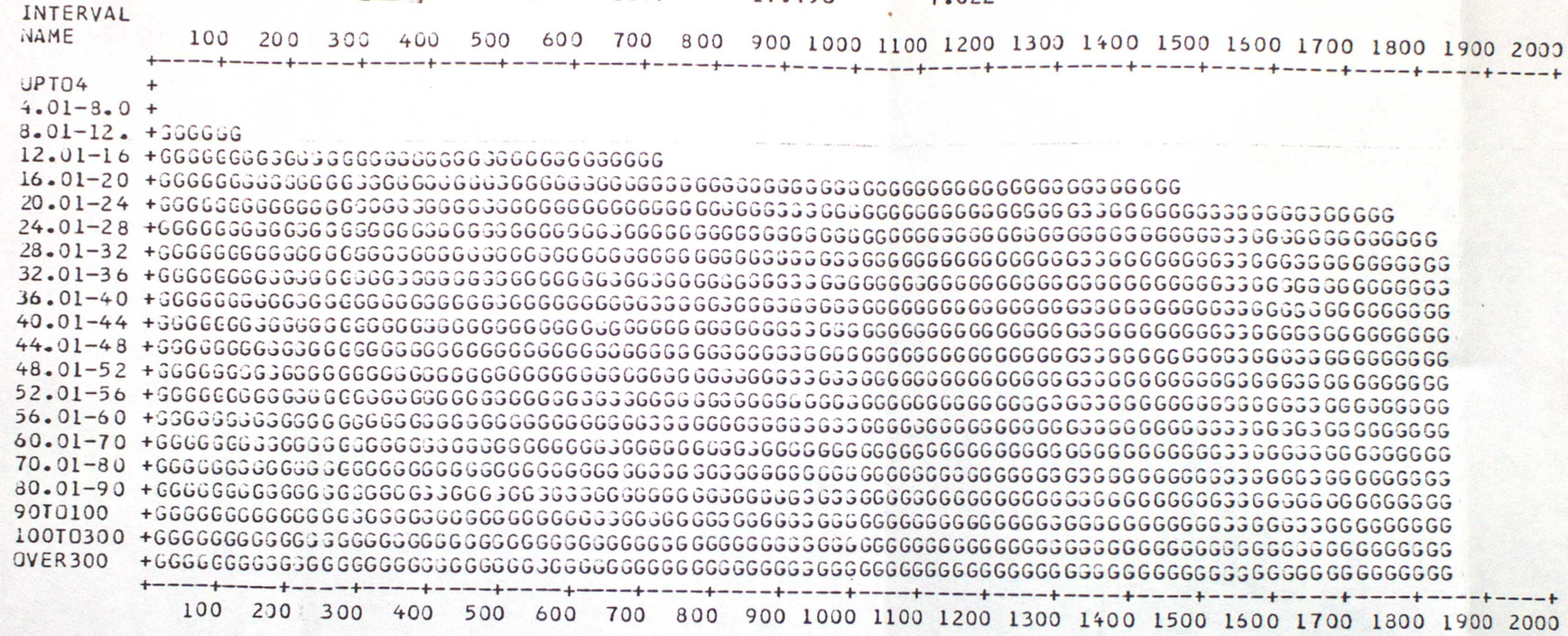
INTERVAL NAME	FREQUENCY INT.	FREQUENCY CUM.	PERCENTAGE INT.	PERCENTAGE CUM.
UPTO4	1	1	1.4	1.4
4.01-8.0	1	2	1.4	2.9
8.01-12.	4	6	5.8	8.7
12.01-16	10	16	14.5	23.2
16.01-20	18	34	26.1	49.3
20.01-24	12	46	17.4	66.7
24.01-28	3	49	4.3	71.0
28.01-32	5	54	7.2	78.3
32.01-36	6	60	8.7	87.0
36.01-40	2	62	2.9	89.9
40.01-44	1	63	1.4	91.3
44.01-48	1	64	1.4	92.8
48.01-52	1	65	1.4	94.2
52.01-56	0	65	0.0	94.2
56.01-60	1	66	1.4	95.7
60.01-70	1	67	1.4	97.1
70.01-80	0	67	0.0	97.1
80.01-90	1	68	1.4	98.6
90TO100	0	68	0.0	98.6
100TO300	1	69	1.4	100.0
OVER300	0	69	0.0	100.0

Fig A.8.21. 1981 Industrial charges.

PAGE 6 ANALYSIS OF ALL 1981 38 ENQUIRY CHARGES (LEGAL ONLY)

CUMULATIVE HISTOGRAM OF VARIABLE 4 CHARGE

	SYMBOL	COUNT	MEAN	ST.DEV.
LEGAL	G	1847	17.496	7.022



INTERVAL NAME	FREQUENCY INT.	FREQUENCY CUM.	PERCENTAGE INT.	PERCENTAGE CUM.
UPTO4	2	2	0.1	0.1
4.01-8.0	6	8	0.3	0.4
8.01-12.	105	113	5.7	6.1
12.01-16	598	711	32.4	38.5
16.01-20	751	1462	40.7	79.2
20.01-24	295	1757	16.0	95.1
24.01-28	55	1812	3.0	98.1
28.01-32	18	1830	1.0	99.1
32.01-36	7	1837	0.4	99.5
36.01-40	0	1837	0.0	99.5
40.01-44	3	1840	0.2	99.6
44.01-48	0	1840	0.0	99.6
48.01-52	1	1841	0.1	99.7
52.01-56	0	1841	0.0	99.7
56.01-60	0	1841	0.0	99.7
60.01-70	2	1843	0.1	99.8
70.01-80	0	1843	0.0	99.8
80.01-90	1	1844	0.1	99.8
90TO100	0	1844	0.0	99.8
100TO300	3	1847	0.2	100.0
OVER300	0	1847	0.0	100.0

Fig A.8.22. 1981 Legal charges.

PAGE 31 ANALYSIS OF ALL 1981 3B ENQUIRY CHARGES

CUMULATIVE HISTOGRAM OF VARIABLE 4 CHARGE

	SYMBOL	COUNT	MEAN	ST.DEV.
RESEARCH	J	86	68.907	155.189

INTERVAL NAME	FREQUENCY INT.	FREQUENCY CUM.	PERCENTAGE INT.	PERCENTAGE CUM.
UPTO4	10	10	11.6	11.6
4.01-8.0	11	21	12.8	24.4
8.01-12.	9	30	10.5	34.9
12.01-16	4	34	4.7	39.5
16.01-20	11	45	12.8	52.3
20.01-24	9	54	10.5	62.8
24.01-28	3	57	3.5	66.3
28.01-32	0	57	0.0	66.3
32.01-36	3	60	3.5	69.8
36.01-40	0	60	0.0	69.8
40.01-44	2	62	2.3	72.1
44.01-48	2	64	2.3	74.4
48.01-52	1	65	1.2	75.6
52.01-56	1	66	1.2	76.7
56.01-60	1	67	1.2	77.9
60.01-70	5	72	5.8	83.7
70.01-80	0	72	0.0	83.7
80.01-90	1	73	1.2	84.9
90TO100	0	73	0.0	84.9
100TO300	7	80	8.1	93.0
OVER300	6	86	7.0	100.0

Fig A.8.23. 1981 Research charges.